NWp
527
G786h

The information in this notice is to be carefully considered.

Hydrographic Notice.

[No. 10 of the year 1895.]

HYDROGRAPHIC NOTICE

RELATING TO

ALASKA;

BERING SEA; ALEUTIAN ISLANDS, &c.,

YAKUTAT BAY, ALASKA, TO KAMCHATKA, INCLUDING BERING SEA AND STRAIT.

PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.

LONDON:
PRINTED FOR THE HYDROGRAPHIC OFFICE, ADMIRALTY,
BY DARLING & SON, LTD., 1, 2, 3, & 5, GREAT ST. THOMAS APOSTLE, E.C.;
AND SOLD BY
J. D. POTTER, AGENT FOR THE SALE OF ADMIRALTY CHARTS,
31, POULTRY, AND 11, KING STREET, TOWER HILL.
1895.

Price Ninepence.

83p. 28cm

The information in this notice is to be carefully considered.

Hydrographic Notice.

[No. 10 of the Year 1895.]

HYDROGRAPHIC NOTICE

RELATING TO

ALASKA;

BERING SEA; ALEUTIAN ISLANDS, &c.

YAKUTAT BAY, ALASKA, TO KAMCHATKA,

INCLUDING BERING SEA AND STRAIT.

PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.

LONDON:
PRINTED FOR THE HYDROGRAPHIC OFFICE, ADMIRALTY,
By DARLING & SON, Ltd., 1, 2, 3, & 5, Great St. Thomas Apostle, E.C.;
AND SOLD BY
J. D. POTTER, Agent for the sale of Admiralty Charts,
31, POULTRY, and 11, KING STREET, TOWER HILL.
1895.

Price Ninepence.

116

NWp
527
G786h

ADVERTISEMENT.

The information in this notice relates to the coast of Alaska, from Yakutat bay to Bering strait; the Aleutian islands; the islands in Bering sea; the east coasts of Kamchatka and Eastern Siberia to Bering strait, including the Komandorski islands; it is derived principally from notices issued by the United States Government and the Remark books of Her Majesty's ships.

As no part of these coasts has yet been surveyed, nor any sailing directions published, great caution must be used in navigating in their vicinity.

This notice cancels all Notices to Mariners relating to these coasts, including No. 423 of 1895.

W. J. L. W.

HYDROGRAPHIC DEPARTMENT
ADMIRALTY,
October 1895.

SO 11803—1000—4/95 Wt. 27098 D & S.

Pacific N. W. History
PROVINCIAL LIBRARY
VICTORIA, B. C.

IN THIS WORK THE BEARINGS ARE ALL MAGNETIC, EXCEPT WHERE MARKED AS TRUE.

THE BEARINGS OF THE VISIBILITY OF LIGHTS OR SECTORS OF LIGHTS ARE FROM SEAWARD, OR TOWARDS THE LIGHT.

THE DISTANCES ARE EXPRESSED IN SEA MILES OF 60 TO A DEGREE OF LATITUDE.

A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO 100 FATHOMS.

THE SOUNDINGS ARE REDUCED TO LOW WATER OF ORDINARY SPRING TIDES.

Hydrographic Notice.

[No. 10 of the Year 1895.]

Hydrographic Notice

relating to

ALASKA; BERING SEA; ALEUTIAN ISLANDS, &c.,

Yakutat Bay, Alaska, to Kamchatka, including Bering Sea and Strait.

COAL.—At St. Paul, Kadiak island, coal may be obtained in quantities up to 50 tons, but neither the supply nor the quality can be depended on. At Unalaska, the usual stock maintained in Dutch harbour is about 1,000 tons, and at Iliuliuk harbour about 400 tons.

At Petropaulovsk, the amount kept by the merchant is very uncertain and must not be depended on; it was only 70 tons in September 1893. The Russian government maintain a stock of coal here; it was 950 tons in 1891, but it is entirely for the use of the Russian man-of-war stationed in these waters on seal fishery duties.

Communication.—The U.S. mail steamer, belonging to the North American Commercial Company, runs between Sitka and Unalaska, calling at Yakutat bay, Nutschuk, St. Paul and Karluk, Kadiak island, Unga, and Sand point (Humboldt harbour), both going and returning. This steamer connects at Sitka with the Pacific Coast Steamship Company's steamers. In 1893, she left Sitka about the 9th day of April, May, September and October, and 13th day of June, July and August, returning from Unalaska about the 22nd day of April, May, September and October, and the 25th day of June, July and August.

The Alaska Commercial Company have a steamer running from Unalaska to port Townsend and San Francisco during the season.

A Russian mail steamer calls twice a year at Petropaulovsk, to which place there is also one winter mail overland *viâ* Siberia. A steamer goes every year to Petropaulovsk, returning at end of season to San Francisco. During the sealing season a small steamer runs between Petropaulovsk and the Komandorski islands.

See charts, Nos. 2,459 and 2,460, North-west Pacific ocean, and No. 787, Pacific ocean, cape Corrientes, Mexico to Kadiak island.

TABLE OF FISHING BANKS IN ALASKAN WATERS AND BERING SEA.

Name.	Locality.	Approx. position.		Area in square miles.	Depth of water in fathoms.	Kind of bottom.	Kinds of fish, &c.
		Latitude.	Longitude.				
Portlock bank ..	North-east of Kadiak island.	58° N.	150° W.	6,800	37 to 67	Grey sand, gravel and broken shells.	Cod numerous; small halibut and red rock fish plentiful.
Albatross bank ..	South-east of Kadiak island.	57° N.	152° W.	3,700	27 to 90	Grey sand, gravel and broken shells.	Cod numerous; small halibut and red rock fish plentiful
Shumagin bank ..	South-east of Shumagin islands.	55° N.	158° W.	1,800	25 to 79	Grey sand, gravel and broken shells.	Cod numerous; small halibut and red rock fish plentiful.
Sannak bank.. ..	South-east of Sannak island.	54° N.	162° W.	1,300	30 to 82	Grey sand, gravel and broken shells.	Cod numerous; small halibut and red rock fish plentiful.
Davidson bank ..	South of Unimak island	54° N.	164° W.	1,600	41 to 72	Grey sand, gravel and broken shells.	Cod numerous; small halibut and red rock fish plentiful.
Kululak ground ..	Bristol bay..	58° N.	160° W.	—	12 to 25	Grey sand, black sand, gravel.	Cod fairly numerous; small halibut and red rock fish also to be found.
Baird bank	Bristol bay..	57° N.	161° W.	9,200	11 to 53	Grey sand, black sand, gravel.	Cod numerous; small halibut and red rock fish plentiful. Best fishing ground is about 20 miles off port Moller.
Slime bank	Bering sea	55° N.	164° W.	1,445	20 to 50	Black sand and gravel.	Cod numerous; small halibut and red rock fish plentiful. Named from intermediate zone of jelly fish, which cover fishing lines and bait with slime. Fishing good up to July 1st. Slime too thick after that date.
————————	Bering sea	58° N.	163° W.	—	—	—	Cod fairly abundant all over eastern part of sea as far out as the 100 fathom line.

FUR SEAL FISHING is prohibited from 1st May to 31st July (both inclusive) north of lat. 35° N. and east of a line along meridian of 180° to lat. 60° 45′ N., thence to lat. 65° 30′ N., long. 168° 45′ W., and on that meridian to the northward. Within an area of 60 miles from the islands of St. Paul and St. George, Pribiloff islands it is prohibited at all times.

YAKUTAT BAY TO COOK'S INLET.

VARIATION IN 1895.

Yakutat bay - - - - - - - -	28° 45′ E.
Cook's inlet—Anchor point - - - -	25° 0′ E.

Decreasing about 5′ annually.

Yakutat bay.—Breakers extend a quarter of a mile off cape Phipps and Ocean cape. H.M.S. *Hyacinth*, when rounding Ocean cape at the distance of about 3 miles, found the water shoal twice from 35 to 13 fathoms. The Indian fishermen say there is nothing under 10 fathoms, but caution is necessary. There is good anchorage to the eastward of Turner point off the village in 13 fathoms with cape Phipps S. 55° W. and Turner point S. 85° W.

Manby point is the west point of Yakutat bay. It is a low, rounded, flat topped, wooded bluff, with a back ground of snow and ice. Thence to Icy cape there are indentations in the coast which trends a little north of West. The water is often discoloured along this coast, probably from glacial streams emptying into it. The coast should be approached with caution.

Mount St. Elias.—The position of this mountain determined in 1892 is latitude 60° 17′ 35″ N., longitude 140° 55′ 20″ W., and the height 18,014 feet.

Icy cape.—The latitude of this cape is reported to be about 12 miles north of the position on the chart; this places the cape in latitude 60° 10′ N., longitude 141° 27′ W.

Point Riou about 8 miles east of Icy cape is prominent.

Cape Yaktage.—There is foul ground off this cape. To the westward, as far as cape Suckling, the coast is formed of small projecting points interspersed with white sandy beaches; shoals extend from the points.

Pamplona bank.—The existence of this reef, originally reported in 1779 as being in latitude 59° 2′ N., longitude 145° 32′ W. but subsequently in latitude 59° 7′ N., longitude 142° 41′ W., is still doubtful. The neighbourhood of this danger is part of the regular sealing ground. The sealers whilst plying their business lie to and send from 8 to 14 boats away in all directions, whence a most careful look-out is kept for the dot on the surface which a seal presents. Yet no one has seen this danger.

See chart, No. 1,499. Cross sound to Kadiak island.

FUR SEAL FISHING is prohibited from 1st May to 31st July (both inclusive) north of lat. 55° N. and east of a line along meridian of 180° to lat. 60° 57′ N., thence to lat. 65° 30′ N., long. 168° 42′ W., and on that meridian to the northward. Within an area of 60 miles from the Islands of St. Paul and St. George, Pribilof islands it is prohibited at all times.

Cod fairly abundant all over eastern part of sea as far out as the 100 fathom line.

Bering Sea ..	..	..	58° N.					165° W.	

Cape Suckling is in longitude 144° W. approximately. It is conspicuous, the cape itself is low, but back from it is a tolerably high hill, separated from the mountains by low land, so that from a distance the cape appears like an island. Immense piles of drift wood have been seen here and numerous floating trees. The current sets to the northward, and the water for a distance of 3 miles off shore is discoloured with whitish spots.

There is a navigable channel of not less than 6 fathoms between cape Suckling and Kayak island, to go through which requires clear weather or a good pilot. About 4 miles to the southward and westward of the cape are two shoals usually marked by breakers; these are outlying dangers on the east side of the channel.

Kayak island.—The south part of the island is high, sloping gently to the north part which is low. From the eastward it appears as two islands, the southern resembling a high table rock of a whitish colour and free from trees or vegetation, the northern moderately high, with three bare peaks well wooded at their bases. There are two trading stations on the island.

Cape St. Elias is very remarkable, being a bare rock much higher than the land behind it. From the cape a reef extends many miles to the southward, on which is an elevated rock with perpendicular sides and flat top. This rock is said to be 500 to 600 feet high, to lie about 6 miles from the cape, and to form an excellent mark. Cape St. Elias is reported to be in latitude 59° 53′ N., longitude 144° 35′ W.

The reefs off cape St. Elias are very dangerous, and great caution should be used in navigating in this vicinity until it has been properly examined.

A ledge of rocks is reported to lie with cape St. Elias bearing N.E. $\frac{3}{8}$ N. (N. 41° E.) distant $3\frac{1}{2}$ miles; this position is doubtful.

A bank with 19 feet of water on it extends from the north-west extreme of Kayak island to the south extreme of Wingham island. The rise of the tide is 9 feet.

Off the N.E. point of Kayak island is a ledge of rock extending about $1\frac{1}{2}$ miles to the north-eastward.

Wingham island, also called Mitchell island and Little Kayak island, is north of the west coast of Kayak island. It is moderately

See chart, No. 1,499.

high, rising in three hummocks, bare on their tops but well wooded at their bases. There is an anchorage between this and Kayak islands, which is best approached from the westward. A village and trading station are on the south-east point.

Middleton island is about 5 miles long, with a greatest breadth of 1¼ miles near the south end, it is low and flat, the highest part, 140 feet high, being about the middle, from which it gradually declines towards the north end, which is a long, low sandspit, and towards the south it preserves a fairly uniform height. It is covered with grass and low bushes, and is resorted to by wild geese, duck, and numerous sea birds. The Alaska Commercial Company have placed blue foxes on the island, and a representative of the Company lives in a hut on the west side of the island. In 1892 there were two men and one woman on the island.

Kelp extends the entire length of the island at a distance of half a mile to 1½ miles from the shore.

Tidal streams.—Observations of the tidal streams showed a rate of 2 to 3 knots an hour, the flood stream setting to the north-east and the ebb in the opposite direction.

Foul ground is said to exist all round Middleton island, reefs extending 2 miles or more north and east of it, and between 3 and 4 miles off its southern end.

Fountain rock has been reported in several positions from 2½ to 5 miles to the northward of the north point.

A rock lies with the south-east point of Middleton island bearing N.N.W. ¾ W. (N. 32° W.) distant nearly 4 miles.

A sunken reef is reported to exist between cape Hinchinbrook and Middleton island in approximately latitude 59° 50′ N., longitude 146° 30′ W. It is about half a mile long in an east and west direction, and the sea sometimes breaks heavily on a part of it.

Sea Otter reef, about 2 miles long in an east and west direction, and awash at low water, breaks heavily, and is estimated to lie with the north point of Middleton island, bearing S. by E. ¾ E. (S. 21° E.) distant 19 miles.

Overfall.—At the distance of 6 to 8 miles to the eastward of Sea Otter reef, an overfall or breaker has been seen, indicating the existence

of a shoal. Approximate position, latitude 59° 49′ N., longitude 145° 55′ W.

Controllers bay is very shoal, about 20 miles wide and is entirely unnavigable.

Alaganik, on the western channel of the Copper river, is a small settlement.

There is said to be a boat channel between cape Whitshed and the north-east point of Hinchinbrook island, but as a heavy surf continually rolls in, it is believed to be impracticable.

PRINCE WILLIAM SOUND.—This extensive inlet requires most careful navigation on account of the rocks and shoals therein. It diverges into many arms, none of which are good harbours, being either too deep for convenient anchorage or else filled with dangers. The western part of the sound is said to have plenty of water, but is full of rocks to a line joining Freemantle point with the north point of Nowell peninsula. The only entrance recommended for sailing vessels is between Hinchinbrook and Montague islands; the channel passing west of Montague and Green islands is good for steamers, as it is smooth when blowing strong from the north-east.

Cape Hinchinbrook, with the land in its vicinity is about 21 minutes of longitude to the eastward of its position on the chart (1894); this places the cape in longitude 146° 26′ W.

Hinchinbrook island is high and mountainous, covered with snow early in June. Cape Hinchinbrook is a gently sloping ridge descending to the sea, with a few breaks in the ridge, and a small pinnacle close to the cape. There are three capes forming the western end of the island south of port Etches, with corresponding small bights between the capes. The middle cape is a low jutting point, and the northern cape is high and rounded. Cape Hinchinbrook and the coast as far as the south point of entrance to port Etches may be approached safely as near as a mile. The north side of the island is clear, excepting the north-west point, where it is reported that a shoal extends to the northward from about one mile to the westward of Johnstone point, and fills up the bight between that point and Hawkin island.

Seal rocks consist of two bare, blackish rocks, connected by a very short reef, covered at high water and surrounded by a number of small rocks extending off about 1½ cables. The principal rocks

See chart, No. 1,499.

cover a space about 300 yards long and 80 yards wide; they are about 40 feet high. When seen from a distance they appear like a schooner under sail. From the rocks a reef extends N.E. by N. about one mile, and breakers have been seen at a distance of 1½ miles to the southward and eastward. To the eastward, northward and southward the rocks should be given a wide berth, at least 3 miles, but on the west side they may be approached to half a mile. There is no visible kelp growing near them.

Port Etches.—The approaches to port Etches are clear of danger. Vessels may anchor on either shore according to the weather, but the usual anchorage is with Phipps point bearing W. ½ N. (N. 84° W.) and the large islet in the bight N.N W. ¾ W. (N. 31° W.). The tidal streams in the outer harbour are weak and vessels usually ride head to wind. There is said to be only 4 feet of water on the rock bearing about E. by N. ½ N. 3½ cables from Phipps point. Landing may be made at almost any place; the landing for the village is in Constantine harbour, in the bight near the village. The spit extending from the village to the shore to the westward is of shingle, about 35 feet high, covered with grass. The chief of the resident Indians and the storekeeper state that in severe gales there is a continuous breaker between the Porpoise rocks and the point southward of the village, and that there is good anchorage between these rocks and the shore to the north-eastward.

Position.—Phipps point is in latitude 60° 21′ N., longitude 146° 50′ W., approximately.

Constantine harbour.—The channel into this harbour has depths of 3 and 4 fathoms to as far as the first island. The entrance should be approached very cautiously. In entering the south side is shoal, the north side deeper, but rocky; when through the entrance favour the south side.

The spit opposite Phipps point is from 10 to 20 feet high and grass grown. At the village in Constantine harbour are three large buildings, used as storehouses and a residence, by the Alaska Commercial Company, and there are about 15 small houses occupied by natives. The population in 1894 was 62.

There are no supplies of any kind, but wood and water are plentiful.

Hawkin island is divided by a boat passage, which leads into Cordova bay from near the middle of the south side of the island.

See charts, No. 1,499: No. 1,737, port Etches, and plan of port Etches on No. 1,451.

There are two islands off the eastern side of the north-east end of Hawkin island, with shallow water between them, and one island off the north-east end. There is a depth of 19 to 20 feet in the channel between Hawkin island and the island off its north-east end and to the eastward of the other two islands.

Cordova bay is deep, with several rocks and islands in it. The shores are low, with pebbly beaches and shoal water extending off some distance. Vessels bound to Cordova bay usually steer for the black bluff, Knowles head; when about 6 miles from this head they alter course to the eastward for the northern side of Cordova bay, avoiding the coast of Hawkin island until well within the bay. There are two salmon canneries at Orca, which is in a little bay about 6 miles north-eastward of cape Whitshed; vessels bound to Orca usually pass between Hawkin island and the island off its north-east end and then feel their way with the lead.

There are many rocks and islets off the point between Cordova bay and port Gravina.

Port Gravina.—The point forming the south-east entrance to port Gravina is a gravel spit about half a mile long and 20 feet high. Thence the point is thickly wooded, continuing along the slope of the hills. About 2 miles north-west of the point and half a mile off shore is a low wooded island and between this island and the point there is good anchorage with soft bottom. The point is free rom rocks.

Knowles head is the south-west end of the peninsula between ports Gravina and Fidalgo. It is a high black bluff and makes an excellent mark. It is in latitude 60° 42′ N., longitude 146° 54′ W. approximately.

Snug Corner cove is well sheltered from all winds, with a depth of 3 to 7 fathoms over a muddy bottom, its shore is low and partly wooded.

Port Fidalgo extends in a winding direction for 28 miles with an average breadth of 2 miles. Towards its upper end are some islands. Its shores are generally low with a pebbly beach. It is reported to be full of shoals.

Bligh's island is 7 miles long, with some islets off its north end. Between the island and the mainland are many rocks and islets.

New chart, No. 1,499.

Port Valdes runs North 12 miles, then about E.N.E. for 5 miles It is indented with small bays and there are many rocks in the port.

Freemantle point is the western point of port Valdes. An island, about 7 miles long and 3 miles wide, lies to the southward of this point. Between this island and the mainland is a passage about 3 miles wide; on the mainland coast are three bays, the northern of which is the largest, with a small islet in its north-east end. In the remaining western part of the sound are many bays generally filled with ice, and with numerous rocks; the shores of these bays are but a border of low land extending to the base of very high mountains.

The principal bays are port Wells, which has Esther island on its eastern side, and Passage canal, which runs to the westward for 13 miles and then to the south-westward for 4 miles, reaching to within 12 miles of Turnagain arm.

Kenai peninsula is all the mainland to the southward of Passage canal and Turnagain arm. On this peninsula the land rises to 6,000 and 8,000 feet. In the interior are two large lakes, Skillokh and Tustumena. The eastern coast is indented by many bays, while the western is generally straight.

The coast from Cochrane point, the south-east point of entrance to Passage canal is very irregular and dotted with rocks to Nowell point.

Nowell point, approximately in latitude 60° 26′ N., longitude 148° 0′ W. The waters of the sound deepen and there are many large islands eastward of this point; the principal islands are Knights island, Green island and Montague island.

From Nowell point the coast trends about 11 miles to the south-westward, to a point where an arm extends first to the north-west and then to the south, terminating in a circular basin full of rocks. About midway along this coast are two arms each extending about 4 miles to the north-west. Facing this coast is an island, distant 2 miles, and 10½ miles long, forming with the mainland, a passage which is so full of rocks as to be navigable only for boats. Immediately west of Countess point is an opening to the southward which terminates 3 miles within its entrance in two small arms. Further west is Icy bay, about 4½ miles long, terminating in a compact body of ice descending from high perpendicular cliffs to the sea. The coast south of Countess point forms the north-west

See chart, No. 1,499.

side of a narrow channel extending 11 miles to the south-westward; this channel is generally less than a mile broad and there are several sunken rocks in it; the sides of the channel are steep rocky mountains. There are rocks and breakers off Waters point, the north point of its southern end, and approximately in latitude 60° 5′ N., longitude 148° 26′ W. In this strait Vancouver's party encountered a violent storm in June, 1794, when a heavy gust of wind brought down from a height on the mountain side an immense mass of earth, trees, and frozen snow. The effects of similar storms were observed in other places; people on these shores should use caution.

Port Bainbridge is an inlet from the ocean, extending 18 miles to the north-north-west; there is a small track of low land with some rocks off it at its head. Being directly open to the ocean, such a violent sea sets in when the wind blows up channel that landing is dangerous. Pyke point is 6 miles from Waters point and is remarkable for its sugar loaf form, between these points are two bays surrounded by lofty, abrupt, snowy mountains. Five miles to the south-eastward of Pyke point is Elrington point, the south-western part of a high, rugged cluster of islands. It is a high, steep, barren promontory of small extent, connected to the island by a narrow isthmus. To the northward of Elrington point are some bays, and a large opening leading to the north-east, with many rocks just above water along its shores.

The island of which Elrington point forms a part is high and rugged. Latouche island lies off its eastern side separated by a channel, 1½ miles wide. Knights island is to the northward of these and is upwards of 27 miles long. Beyond this are other smaller islands. The islands near the sea are high and rocky, those further in are low.

Green island, between Knights and Montague islands, is covered with wood and verdure. Three to 4½ miles about N.N.W. ½ W. from the north point of Green island are some ledges of rock, above and below water; this locality is dangerous.

The strait between Green and Montague islands is full of sunken rocks, very steep to, and affording no indication, by the lead, of their existence.

MONTAGUE ISLAND is reported to be about 21 minutes of longitude to the eastward of its position on the chart (1895), and it

See chart, No. 1,499.

is also said to be shown to the north and east of its place relatively to cape Hinchinbrook. The island is very high and mountainous. The north coast consists of three points, which enclose deep bays, the western is the deepest and affords good anchorage. A large islet lies off the north-east point and a shoal, with a number of islets on it, extends off the north-west point for a distance of 2 miles. The east coast is formed by high bluffs ascending quickly to the snow covered mountains, excepting abreast the Wooded islands, where there is a deep bight and low bluffs capped by a plateau ascending gently to the mountains. The mountain ridge descends gradually to cape Cleare, off which are several rocks or islets and a reef extending to the southward for about 1¼ miles. The west coast is rugged and bold, except near Chalmers harbour, where it is generally low, and north of which are many dangerous rocks.

Wooded islands about 17 miles to the north-eastward of cape Cleare, form a group of wooded, perpendicular sided, flat topped islands, varying from 20 to 800 yards in length and from 60 to 130 feet in height, and occupying a space of about 7 miles along the coast. There are five large islands; the northern island is about 3 miles off shore, and the southern about one mile. The bight inside them appears to be full of reefs and rocks. These islands should be given a berth of at least 2 miles, as breakers have been seen extending 1¼ miles to the north-east of the northern island.

Coral rock is near cape Cleare, but close to the beach with good water all round it.

West of Montague island the channel is clear for about 20 miles, when there are rocks in mid-channel; vessels should then favour the western side of the channel and should not use the strait between Montague and Green islands, although the steamers between Kadiak and port Etches frequently use it.

Macleod bay is about 10 miles from the south-west end of Montague island. Its outer points, Bryant on the south and Woodcock on the north, are 2 miles apart and joined by a bank having 6 to 8 fathoms on it, inside which are 12 to 21 fathoms. In the northern part of the bay there is good anchorage; here the bay takes a turn to the north around a point which is bold and can be passed close to. With the south point of the bay just shut in by this point a vessel can lie in 4½ to 5 fathoms at a cable from the shore.

Hanning bay, in about latitude 59° 58′ N., longitude 147° 48′ W., is not recommended as an anchorage.

See chart, No. 1,499.

Chalmers harbour is dangerous to those unacquainted with it. There are many rocks just below water off the entrance, and there is a small woody islet in the entrance. A rock, known as the South Passage rock, lies about S.W. by W. ¾ W. (S. 65° W.) nearly one mile from the north point, and N.W. ¼ N. (N. 42° W.) three-quarters of a mile from the islet. North of this is the North Passage rock N.N.W. ¼ W. (N. 25° W.) 2½ miles from the north point. These rocks are covered at high water and are not marked by kelp. Approaching from the southward there are two shoals in mid-channel, the southern having from 6 to 19 fathoms, with no kelp; the other, three-quarters of a mile to the north-east, is a patch of 3 fathoms, with 5 to 7 fathoms close to, this patch has kelp on it.

Tides.—It is high water, full and change, at 1h. 0m., springs rise 13 to 14½ feet, the night tides being a foot more than the day tides. There is no current in the harbour, but outside it sets to the southward.

Cape Puget is on the mainland. The coast to the northward is somewhat indented with small bays and coves.

Blyings sound is the name given to the waters between cape Puget and the Chiswell islands. Running inland from this sound are Days harbour, Resurrection bay and Ayalik bay; these have not been examined. In the mouth of Resurrection bay are two small islands.

Chiswell islands, a group of barren, rugged rocks. The eastern rock is a single detached rock, the northern has several small rocks and islets about it. Between these islands and the mainland is a passage not less than a mile wide, with a least depth in mid-channel of 35 fathoms.

Seal rocks lie about 7 miles to the southward of the Chiswell islands; there are several islets and rocks. The southern rock is in about latitude 59° 33′ N., longitude 149° 34′ W.

The coast between the Chiswell and Pye islands presents a comparatively unbroken appearance.

Pye islands.—The southern of these islands has a very conspicuous peak; it is not very high but slopes regularly from the top to the sea. A group of rocks lies 3 to 4 miles S.S.W. (S. 22° W.) from it, forming a very dangerous reef. The northern is the largest of these islands. There is a passage between the inner island and

See chart, No. 1,499.

the mainland, very narrow near the middle for a distance of about 100 yards, where there is a least depth of 5 fathoms at very low water. Kelp shows plainly on its eastern side.

Nuka bay extends to the northward in two arms. In this bay an immense glacier extends apparently to the water's edge. The coast here is very mountainous, descending abruptly to the sea, except in the valleys. Detached groups of rock lie off the coast rendering a near approach dangerous.

Gore point is an abrupt, moderately high cliff, connected with the mainland by a low peninsula covered with trees. To the westward of port Dick the coast is fronted with rocks until near the Chugatz islands.

Chugatz islands.—This group comprises three small islands and some rocks. The islands are high, bold and rounded; their coasts on the seaward sides are seemingly free from dangers at the distance of a mile, no tide rips or breakers being seen. It is inadvisable to pass between them; there are some low rocks apparently joined to a cluster of higher rocks to the south-east of the western island, and there is a cluster of rocks to the south-west of the middle island. Cape Elizabeth, approximately in latitude 59° 9′ N., longitude 151° 52′ W., is of a reddish brown colour as seen through the fog.

COOK'S INLET.

General description.—The mouth of this inlet lies between cape Elizabeth and cape Douglas: the distance between these capes is about 46 miles, and from the mouth to the head of the inlet about 155 miles.

The inlet may be entered on either side of the Barren islands, but the passage between the Barren and Chugatz islands is preferable because the land on both sides in that passage is bolder than that to the southward of the Barren islands. The tops of the Chugatz islands are generally covered with snow, the lower parts are wooded.

Easterly and north-easterly winds are very violent and generally bring thick weather. During such weather the passage north of the Barren islands is especially recommended, as the ship arrives in smooth water after entering the inlet

The east shore is generally low and flat with many lakes and rivers, the low land extending to the mountain ranges, which are about on a line between the heads of Chugachick bay and Turnagain arm.

See chart, No. 1,499.

There are a few indentations along this coast, but otherwise the shore line is unbroken.

The west shore in the vicinity of cape Douglas (latitude 58° 54′ N., longitude 153° 15′ W. is low and flat, but to the northward, mountain ranges border the inlet as far as the north end of Redoubt bay, thence to the North Foreland it is low and flat, again becoming higher to the northward.

By keeping near the east shore to East Foreland and then near the west and north shores from West Foreland foul ground will be avoided.

Tidal streams.—The flood stream sets to the northward in and around the Barren islands with some force, a part going over to cape Douglas and into Shelikoff strait, a part into Kachekmak bay, but the main stream runs up the inlet parallel to the east shore until deflected by East Foreland into Trading bay, thence around and near the north shore into Knik river and Turnagain arm. The ebb stream sets between the Forelands and is stronger near the west shore; on this shore most of the boulders and debris brought down by the ice is deposited. A constant southerly set is reported off cape Douglas The rate of the flood stream off Munina during its strength was $2\frac{1}{2}$ knots an hour; off Kenai the flood stream ran N. by W. $\frac{1}{2}$ W. (N. 17° W.) $2\frac{1}{4}$ knots, and the ebb S. by E. (S. 11° E.) $2\frac{1}{2}$ knots; off Chinitua the flood ran N. by E. (N. 11° E.) $1\frac{1}{2}$ knots, and the ebb South $1\frac{1}{2}$ knots.

Barren islands consist of two principal islands and several small ones; these islands are not wooded and their tops are seldom covered with snow. A shoal has been reported to lie E. $\frac{3}{8}$ S. (S. 86° E.) from Amatuli island. To the westward of this island are heavy tide rips and whirls, streaks of white foam form on the water. South-west of the island the surface drift of the tidal stream was found to be W.N.W. (N. 67° W.) $1\frac{1}{2}$ knots an hour at half flood; the strength below the surface was much greater.

Port Chatham stretches $5\frac{1}{2}$ miles to the north-east and terminates in an excellent anchorage extending 2 miles east and west and one mile north and south. The passage to the north-west of cape Elizabeth is free from hidden dangers. Some shoals extend a little way off the points on the north side of the port. An islet with rocks around it lies south-west of the south-east entrance point of the anchorage. Soundings are tolerably regular from 5 to 25 fathoms. The shores are generally low and wooded; excellent water can be obtained.

See chart, No. 1,499.

Tides.—It is high water, full and change, at about 1h. 0m.; the rise of tide 10 to 14 feet: the tides are influenced by the wind.

Cape Bede is a fairly high, jutting out point. From here the coast trends N.E. by E. (N. 56° E.). The coast is woody.

Flat island, usually called Magnet island, is just north of cape Bede, it is low and flat. Tide rips have been seen 1¼ miles off the island, with 30 fathoms, rocky bottom close to.

Port Graham is 7 miles north-east of cape Bede. It extends eastward and then south-eastward. On the east side is a good beach. It is a good landlocked harbour, but the entrance is narrow, tortuous and, to a stranger, dangerous. Passage island lies nearly in the centre of the entrance, the channel being to the northward. There are two small anchorages outside, one, Coal harbour, being under Dangerous cape; between these anchorages is foul ground, and foul ground also extends from Passage island in a south-west direction nearly to the mainland. Dangerous cape is in latitude 59° 24′ N., longitude 151° 53′ W.

Chesloknu (Saldovia) bay is a good anchorage in easterly winds; on its north shore is the village of Saldovia. The entrance is narrow and intricate and the anchorage, for vessels of 12 feet draught, limited. There is an inner harbour where small vessels find perfect protection, and a shingle beach affords an excellent place for cleaning or repair.

Kachekmak bay is composed of two bays separated by Coal point, to the north-east of which is Chugachik bay. The Archimandritof rocks do not exist as shown on the charts.

Coal bay, on the north-east side of Coal point, a point projecting 5 or 6 miles from the mainland and forming an excellent breakwater. Anchorage inside and near Coal point is not safe in less than 8 fathoms. Coal is found on the beach. There is a house with outbuildings on the end of the point. Flats extend out nearly a mile at the head of the bay. The range of the tide is from 12 to 20 feet. The tidal streams run in and out of the bay and attain a rate of 3 knots an hour at springs.

Coal.—In the bluff between Coal point and Bluff point there are croppings of coal, from which a steamer, using two boats, recently obtained 30 tons in a few hours.

See chart, No. 1,499 and plan, port Graham on No. 1,454.

Bluff point is a high, rounded, almost perpendicular bluff. From this point the eastern shore of Cook's inlet is a flat, unbroken line of bluffs, from 110 to 160 feet high, without any noticeable marks to cape Kussilof. From Anchor point to East Foreland the coast takes a general northerly direction. Between Bluff and Anchor points kelp extends 4 miles off shore, and between Anchor point and cape Kussilof there are many rocks, uncovered at low water, from one to 2 miles off shore. There are villages at Munina (called Ninitchick by the natives), cape Kussilof and Kaknu river, the only canning establishment in the inlet being at this latter place, which is also a station of the Alaska Commercial Company. These villages are partly on the bluff and partly on the banks of the rivers; they are difficult to find except in clear weather, the break in the height of the bluff being the only mark to indicate their position.

Munina.—Reefs extend 2 miles off shore northward and southward of Munina; the southern reef is between the rivers. There is good anchorage between the reefs.

Cape Kussilof.—The bluff becomes much lower here and so continues to the Kaknu river, where it rises, and the coast between this river and the East Foreland is from 110 to 160 feet high. At Kussilof river the rise of the tide is from 18 to 28 feet. A little to the southward of cape Kussilof, a shoal extends in a rounded curve to the westward of Kussilof river, where the edge of the bank is about 4 miles off shore, it then slowly curves into the shore to the northward at 4 or 5 miles south of the East Foreland.

Kussilof river.—The channel is buoyed by 7 floating poles with flags, the outer buoy being a barrel, which are kept on the starboard hand entering.

East Foreland, in latitude 60° 43′ N., longitude 151° 26′ W. The narrowest part of the inlet is between the East and West Forelands. A large shoal lies with its southern end 7 miles W. by N. (N. 79° W.) from the East Foreland and its northern end 5 miles S.E. (S. 45° E.) from the North Foreland. North of the East Foreland and between it and the large shoal are so many banks and shoals that this part of the inlet is not navigable with safety. Eastward of the East Foreland to about 7 miles westward of Possession point, a bank extends from 3 to 5 miles off shore, which is studded with conical rocks and banks of sand; the rocks are of various heights, some showing above water, rising from a depth of 4 to 9 fathoms and are bold close to; it is supposed that this bank joins the shoal southward of the North Foreland.

See chart, No. 1,499.

Turnagain arm extends nearly 40 miles to the eastward. From both shores flats extend, 3 to 5 miles from the northern and 1½ to 3 miles from the southern shore. There is a shoal in mid-channel which dries in many places; it is 4½ miles in length, north-east and south-west and 1½ miles in width. The shores are low and well wooded, rising gradually to the inner entrance where they suddenly rise, in perpendicular cliffs, to high mountains. It is high water, full and change, at about 6h. 0m.; the range of the tide is from 13 to 35 feet. The tidal stream attains a rate of 5 to 6 knots at springs. Great caution is necessary in picking up an anchorage.

Knik river is a series of dry sand banks for a distance of 18 miles at low water; it is a large sheet of water at high tide.

Moushukli (Turnagain) island is 3½ miles long north-east and south-west and 1½ miles wide. From its west point a shoal extends 1½ miles to the north-west narrowing the channel between the island and the main to about one mile. A shoal bank extends from Mackenzie point, about 5 miles off shore, to the North Foreland.

North Foreland, in latitude 61° 4′ N., longitude 151° 8′ W. Tolerable anchorage can be found for 6 miles to the north-east of this Foreland; it is, however, exposed to the terrific southerly winds which are frequent here. A few miles north of this Foreland is a salmon salting establishment.

Trading bay.—There is a village on this bay, named Tyonick, about 9 miles westward of the North Foreland. From this village to the West Foreland, shallow water extends off shore for a distance of 2½ miles.

West Foreland.—This bluff is the west side of the narrow part of the inlet. A rock, visible at half tide, lies a quarter of a mile off it and there are depths of 7 to 12 fathoms at one mile from the point.

Redoubt bay extends from West Foreland to Harriet point, a moderately high cliff. The shores of this bay are low beaches, with a large glacier at about the middle of it. A shoal extends about 3 miles to the eastward of Harriet point.

Kalgin island, 13 miles long but narrow, is covered with pine trees; it is very low, the southern parts so low as to be difficult

---

See chart, No. 1,499.

to make out, the northern part is composed of low bluffs with numerous off-lying, bare islets. There is a flat hillock a short distance from the south end with low land between it and the northern bluffs.

From the island, shoals extend 7 miles to the northward, then with a sweep to the eastward trend to the southward, making foul ground along the east coast of the island for a width of 3 miles. Shoals continue to the southward for a distance of 35 miles from the island, with varying depths of 9 to less than 2 fathoms; the islands with the shoals dividing this part of the inlet into two channels. The portion of the inlet westward of the island and shoals is full of sand and boulder banks. A bank, which dries in places at low water, lies 13 miles southward of the south point of the island.

There may be a navigable channel along the western shore, but not a safe one.

Iliamna volcano is a high, sharp, conical peak. It is in latitude 60° 5′ N., longitude 153° 0′ W.

Redoubt volcano, westward of Harriet point, has a somewhat flattened top, which, from the eastward, appears notched, the northern part a sharp spike, the southern, slightly rounded.

Snug harbour is a good anchorage; the entrance is south of Chisick island and thence through a narrow strait to the harbour. The northern part of the harbour is an extensive flat and a reef extending north from the island closes it on that side.

Chinitua bay, S.E. ½ S. (S. 39° E.) 11 miles from Iliamna volcano, is small, protected by a reef and islets extending from the southern point. The bay, marked on the charts between this and Chisick island, does not exist. There are a few huts at Chinitua. The coast to the southward to Kamishak bay should be given a berth of at least 2 miles.

Kamishak bay is shallow, the western side from Tignagvik point to and including some islets south-west of Shaw island is a flat or shoal of boulders. The best approach to the bay is north of Augustine island, if from the northward, but from the southward pass south of Shaw island in the middle of the channel, hauling to the northward when clear of the island and giving the north end a

berth of over 2 miles. There are no harbours between Chinitua and cape Douglas except for very small vessels.

Augustine island is remarkable, rising uniformly from the sea to its summit. It is a volcano and smoke is frequently seen issuing from the crater. About 500 feet below the summit, which is slightly flattened, is a terrace which from the eastward appears as a shoulder; what appeared to be smoke was seen rising from this.

A reef extends 1¼ miles off the west point of the island consisting of islets and rocks above water. There are many rocks along the shores, from a quarter to half a mile off, while from the north shore they extend much further. There is a rocky patch with a rock awash at half tide 7 miles S.E. (S. 45° E.) of the peak. The island, marked on the chart, to the north-west of the peak, is said not to exist. It is inadvisable to attempt the passage between Augustine and Shaw islands on account of sunken dangers.

Shaw island is very low, flat and wooded, but it is difficult to distinguish it from the mainland. Reefs extend 2 miles off its north and north-west sides.

Cape Douglas is a low, flat point, the end of a low, flat, ice covered plateau. About 3 miles back the land rises abruptly to very high snow covered peaks. It is in latitude 58° 54′ N., longitude 153° 15′ W.

Directions.—A course up the inlet at from 2 to 5 miles off the eastern shore gives depths of from 30 to 20 fathoms, shoaling to 12 fathoms off the north end of Kalgin island. The flat off Kussilof river should be given a good berth. If bound to the upper part of the inlet cross from under East Foreland to West Foreland, either of which may be approached to a distance of about 1½ miles. Round West Foreland and steer for North Foreland, keeping on that side of the channel from which the tidal stream sets. From North Foreland a N.E. ¼ E. (N. 48° E.) course leads to the islands off Mackenzie point. The lead should be kept going in the inlet, especially to the northward of Kalgin island, as banks are always forming.

If bound to Chinitua, or Snug harbour, keep south of the parallel of Anchor point, hauling up to the western shore when Iliamna volcano bears N.W. by N. (N. 34° W.) keeping to the westward of the banks and using the lead constantly.

See chart, No. 1499.

The water in the upper part of the inlet is of a whitish colour; there are many yellowish patches or streaks during the flood stream; these are not always an indication of shoal water, but if they are dark in colour caution should be used in entering them.

AFOGNAK, KADIAK, TRINITY AND SEMIDI ISLANDS.

VARIATION IN 1895.

St. Paul - - - - 24° 0′ E.

Decreasing 5′ annually.

Portlock bank extends north-eastward from Kadiak island for a distance of about 120 miles and is irregular in shape; its area inside the 100 fathoms line is about 6,800 square miles. Isolated soundings of 68 to 81 fathoms occur near Kadiak island, but there are no indications of an extensive depression between the bank and the land. This bank is a valuable fishing ground, but vessels frequenting it must be provided with ground tackle in order to ride out such storms as they may meet with. A study of the streams on this bank seems to show that there is no real current; the stream probably sets to the eastward during the rising tide and to the south-west during the falling tide.

Albatross bank lies off the south-eastern side of Kadiak island, and extends the entire length of that island and in front of the Trinity islands. At the eastern end it is continuous with the Portlock bank. Along some portions of the coast, as in the neighbourhood of Sitkalidak island, the bank is separated from the land by comparatively deep water, while in other places shoal water intervenes. The 100 fathoms line is 25 to 45 miles off the land and the estimated area inside that limit is 3,700 square miles. There are many excellent harbours and convenient anchorages near this bank, which make it one of the most desirable fishing grounds on the Alaskan coast.

Shuyak island.—The north coast of this island is dangerous. Its south point is in latitude 58° 30′ N., longitude 152° 25′ W.

See chart, No. 1,499.

Afognak island.—The coasts of this island are everywhere indented by large and small bays; they are not well known, and in many places off-lying sunken rocks and rocks awash have been observed. It is separated from Kadiak by Afognak bay and a strait, not navigable, which really divides it from Raspberry island.

Tonki cape bay is a very good and secure anchorage; it is resorted to by sealers for wood and water and is only open to the northward. The water in the bay is deep and apparently clear of rocks or shoals. Anchor close to the head of the bay in lat. 58° 17′ N., long. 152° 2′ W.

Sea Otter island.—The sea breaks for a distance of at least 2 miles in all directions round Sea Otter island.

Marmot island is a table land, somewhat highest at its western end. Two sunken rocks exist between Marmot island and Sea Lion rocks.

Kadiak island is very mountainous, its coasts are indented by large bays into which a number of rivers empty. Its greatest length is 90 miles north and south and its breadth 45 miles; it is composed chiefly of slate and graystone. The climate is not pleasant, depending upon the winds; it is seldom warm even in summer and is generally damp. There are a few settlements on the island

Spruce island shows as a bluff with its highest part to the northward.

In the narrow strait between Spruce and Kadiak islands is a pinnacle rock, with 17 feet over it and deep water all round. It lies about three-quarters of a mile S.W. of the south-west point of Spruce island, in the centre of the channel between a small island abreast of Woman's bay and a kelp reef, which is covered at high water. This channel should not be used.

ST. PAUL HARBOUR.—This is a good harbour, easy of access, more free from fog than others (although fogs are very prevalent), and with more opportunities of communicating with Sitka and civilization. It is on the track followed by all sealers, bound either to Sand point (Humboldt harbour) or Russian waters.

The village is on the coast of Kadiak island opposite the centre of Near island.

See chart, No. 1,499, and plan, St. Paul harbour on No. 1,454.

The regular steamer running between Sitka and Unalaska calls here during the season.

Position.—The Observation spot is said to be in latitude 57° 47′ 57″ N., longitude 152° 21′ 21″ W.

Supplies.—Coal in quantities up to 50 tons may be obtained at $12 a ton delivered alongside, but neither the supply nor the quality can be depended on. There is a lighter which holds about 35 tons.

Provisions are not to be had.

There is good cod and halibut fishing in the harbour, but the fish caught inshore are said to be unwholesome.

Long island is low, long and undulating, its top is covered with trees, and the coast is formed of steep-faced rocky cliffs.

The Devil's prongs are three triangular-shaped peaks, the top of the middle one being flattened.

Anchorage.—Large vessels anchor in the roadstead, the bottom is soft and the least depth yet found 6 fathoms; it is open to north-east winds. Small vessels go into the inner harbour; they can haul on the beach for cleaning or repair.

Dangers.—The following dangers are reported to exist in the approach to St. Paul harbour :—

North channel.—Williams reef breaks heavily and extends well to the southward.

Kadiak rock is very pointed and has 9 feet water on it.

A breaker, on which the depth is unknown, bearing about N.N.E. (N. 22° E.) distant 2⅛ miles from the east end of Long island.

Rocks about three-quarters of a mile N.E. by N. (N. 34° E.) from the north end of Long island.

Hutchinson reef, a rocky patch with 9 feet water on it at low water, about one mile N.E. (N. 45° E.) from the Outer Spruce cape, and extending about half a mile in a north-easterly direction.

St. George rock, awash at low water and marked by kelp half a mile N.E. by E. ½ E. (N. 62° E.) from the Twins.

See plan, St. Paul harbour, on No. 1,454.

Hutchinson reef and St. George rock are said to be one shoal. There is no passage between them.

A breaker, a quarter of a mile West of the south-west end of Round Lumpy rock.

A detached rock, about 1½ cables eastward of Outer Spruce cape.

A rock, S.E. by E. ½ E. (S. 62° E.) a quarter of a mile from Outer Spruce cape.

Channel rock, 6 cables S. by E. ½ E. (S. 17° E.) from Outer Spruce cape.

A rock, about 1¼ cables off the north end of Holiday island.

South channel.—The Outer Humpback, about 7 miles W.N.W. (N. 67° W.) from cape Greville. It is 6 feet above high water with 10 to 20 fathoms close to and 70 fathoms near it.

A rock, awash at low water springs, lies three-quarters of a mile S.S.W. (S. 22° W.) from the Outer Humpback; foul ground extends about one cable to the northward of it, in other directions there are 8 to 15 fathoms at the distance of half a cable.

Kalisin reef, awash at high water, shows plainly and lies S.S.W. ½ W. (S. 28° W.) about 2 miles from the Outer Humpback.

Vasilief reef, with 4 feet water on it, lies about W.S.W. (S. 67° W.) 6 cables from the south end of Long island.

Inner Humpback is a rock above water.

A 9-feet patch (Chalk), lies a quarter of a mile westward of the Inner Humpback.

Buoy.—There was a buoy off the wharf on Wooded island, but it had disappeared in June, 1894.

Shoals.—There are many shoals extending about 3½ cables to the eastward from the islands eastward of Near island.

See plan, St. Paul harbour, on No. 1,454.

A 6-feet shoal is nearly in mid-channel, south-westward of the west point of Wooded island. Keep closer to Wooded island to avoid it.

A small island, with reefs extending to the northward and southward of it for a considerable distance, lies nearly 4 cables to the north of the above shoal.

Bank.—A bank of small area, with a depth of 6 fathoms on it, lies with Observation point bearing W. $\frac{3}{4}$ S. (S. 82° W.), distant $5\frac{1}{2}$ cables.

The North channel is good in fair weather, but the Williams and Hutchinson reefs make it dangerous in thick weather. This locality is subject to fogs that obscure all objects at any time. The breakers on Williams reef can be seen from a distance of 3 miles in clear weather. Vessels should not pass between Williams reef and Long island unless well acquainted with the locality.

Directions.—Pass about a mile north-west of Williams reef, steer for the Channel rock and when the strait between Near and Kadiak islands opens alter course for it, then proceed in mid-channel through the strait to the wharf at St. Paul. The Hutchinson reef and other dangers to the northward are avoided by keeping the north-east end of Near island west of S.W. by S. (S. 34° W.).

The South channel is the best, but there are strong tidal streams in it. The U.S.S. *Concord*, whilst steering West for a position to the southward of the Inner Humpback, experienced a strong set to the northward.

Directions.—Bound to St. Paul, it is best to make Ugak, an excellent land mark, though in any but thick weather, cape Greville, with its outlying rocks, is unmistakable. A peculiar shaped ridge, called the Devil's Thumb, in line with the south end of Long island, leads to the Outer Humpback, which, like the Inner, consists of 2 or 3 small rocks with one large one.

The Outer Humpback appears as one rock on a S.W. by S. bearing.

With the Outer Humpback about South one mile, steer West, taking care to give the position of the doubtful shoal southward of the Inner Humpback a good berth, until the south-east extreme of Wooded island is in line with the north-west extreme of Long island.

See plan, St. Paul harbour, on No. 1,454.

Then steer about N. ½ W. (N. 6° W.) for the white church near the west point of Wooded island ; all dangers on the western side of the channel are avoided by keeping half a mile off the islands. When close to the west point of Wooded island, which is marked by kelp, steer N. by W. ½ W. (N. 17° W.) for a few huts on a beach of Kadiak island and anchor in about 14 fathoms at a convenient distance from the northern shore.

Kelp extends fully a quarter of a mile north of Holiday island.

Wharf.—The Commercial Company's wharf at St. Paul is opposite the north end of Near island. There is a good but narrow channel for large vessels right up to the wharf. Going in, there are a few rocks on the starboard hand, close to the shore and plainly visible at all times. On the port hand, there is a rock above water about 100 yards off the north end of Near island, which is avoided by keeping the Company's wharf open of the point.

Cape Greville, in latitude 57° 37′ N., longitude 152° 2′ W., from the eastward appears as a low broken cape of a light colour, with dark rocks stretching off its extreme to the northward for about 2 miles. It is backed by a range of pine clad hills, behind which again rise sharp peaked snowy mountains.

Ugak island has three small peaks or knobs, the southern being the highest ; it is reported to be about 1½ miles to the south-eastward of its charted position, and the width of the strait between it and Kadiak to be about 3 miles.

Ugak bay is a deep inlet, 16 miles long and 2½ miles wide ; there are some good anchorages in it, the best is in the south-west part. In entering the bay keep close to the south shore as the north shore is fringed with outlying rocks.

St. Orlovsk was originally a Russian-American settlement, it is on a small stream which may be used by canoes to communicate with Kiliuda bay.

Kiliuda bay.—This consists of two bays, either of which affords good shelter.

Dangerous cape should be approached with caution.

See chart, No. 1,499.

Sitkalidak island is separated from Kadiak island by a strait of the same name. This strait is wide at the entrances but narrows in places to 250 yards. The north coast of the island is indented with bays. There is a rock, on which the sea breaks, bearing North, a little over one mile, from cape Barnabas.

Port Hobron, at the head of the second bay from cape Barnabas, is a good harbour for all classes of vessels. An abundant supply of fresh water can be procured from a mountain stream near the head of the bay on the west side. Fish are caught in a lake about 1½ miles distant from the settlement.

Old harbour is in latitude 57° 11′ N., longitude 153° 13′ W., on the coast of Kadiak island. The anchorage is in 7 fathoms off an Indian village called by the natives Three Saints, which is about 4 miles to the northward of the bay of Three Saints. Between Three Saints bay and Old harbour is the beautiful harbour of Lisianski bay (not marked on charts).

Directions.—To enter Old harbour make Two Headed island, which has two high irregularly rounded peaks and is easily recognised. I eave it to the westward, and if the weather is clear Black point, the south-west point of Sitkalidak island, will be seen. Having passed the rocks off Black point, a mid-channel course round the second prominent point on the starboard hand leads to the strait where Old harbour is situated. There is bold water in the strait, which is free from hidden dangers except near the land. Passing Old harbour there is a narrow tortuous channel into Sitkalidak strait, which no stranger should attempt with a vessel drawing more than 8 feet.

The country surrounding Old harbour is mountainous with a narrow belt of comparatively level land, on which the village stands near the water. There is a luxuriant growth of grass and flowers during the summer ; alder bushes grow, and in the sheltered valleys the poplar is found of sufficient size to be valuable for building purposes. The village of Three Saints is scattered along the shingle beach and consists of sod houses, thatched with grass, and a few log buildings. The people engage in hunting, fishing, and drying salmon for their winter food supply and a few are in the employ of the salmon fishery in the vicinity.

See chart, No. 1,499.

Black point, the south-west point of Sitkalidak island, is very dark; about one cable off it is an islet and a quarter of a mile further off a rock just above water.

Alsentia bay consists of two arms, one running to the northward, the other to the westward, on this latter is the village of Alsentia, off which there is good anchorage. In proceeding to this anchorage from the south-east, with Two Headed island on the starboard side, favour the island to avoid a sunken rock in about mid-channel, on which the sea breaks at low water in heavy weather. The passage from the north and east is free from hidden dangers.

Geese islands.—A rock exists about 2 miles north-east of the easternmost of the Geese islands. The channel between this group and Kadiak is unsafe.

Sitchinak strait.—Tide rips have been observed in this strait, resembling a line of breakers, and extending well across the strait from the Geese islands.

In the strait the flood tidal stream sets to the westward and the ebb stream to the eastward. When passing through the strait, keep on the Sitchinak side and give the Geese islands a good berth. A mid-channel course is clear, with depths of 12 to 17 fathoms, bottom sand.

Russian harbour is on Kadiak island, inside of the Geese islands.

Cape Trinity, the north-west point of Russian harbour, as well as the coast to the north-west of it, is fringed with rocks. The cape is in latitude 56° 45′ N., longitude 154° 2′ W. approximately.

ALITAK BAY is a bay of many branches. There is a canning establishment at its head. Close along its south shore are many rocks and on the north shore many islets and rocks.

Olga bay.—About 10 miles north of cape Alitak, Alitak bay contracts abruptly and continues narrow for a distance of about 7 miles, when it expands into a great bay fully 15 miles in length, composed of two parts connected by a narrow neck of water. This upper portion is Olga bay. At its north-east end is a fishing station. The narrows connecting Alitak and Olga bays receive many small streams on both sides; several native villages are situated at the mouths of these streams.

See charts, No. 1,499 and No. 1,500, Kadiak island to Siguam islands.

Snug harbour is a small bay on the western side of the narrows about 2 miles in from Alitak bay.

Lazy bay is on the north-west side of Alitak bay in latitude 56° 54′ N., longitude 154° 6′ W. In entering this bay a small rocky islet, Egg islet, is on the port hand, with a small rock west of it which uncovers at low water, and which is avoided by keeping nearer the north side of the entrance. There are many other dangers and great care must be used. On the north side of the entrance is a peak 1,100 feet high; this peak shows dark and is very conspicuous. The beaches are generally steep-to and boats can land on them. There is an abundance of good water and also good shooting, ptarmigan being plentiful. Steer in with the high peak bearing N.W. ½ N. (N. 39° W.) and anchor in 15 fathoms. At three-quarters of a mile from the shore are soundings of 15 to 20 fathoms.*

Cape Alitak is a high double peak with a knoll near the shore, it is connected to the island by a narrow neck of land. Anchorage has been obtained in 9 fathoms, black and grey sand, with cape Alitak bearing N.W. by W. ¾ W. (N. 65° W.) distant 3 miles.

The coast from cape Alitak trends north-westerly to and around cape Ikalik and the Seal rocks. It should be given a wide berth. From Seal rocks the coast trends to the northward and eastward to Northern strait, which separates Kadiak island from Afognak and Raspberry islands. The coast is indented by large bays and rivers, some of them nearly dividing the island.

Cape Karluk, 1,600 feet high, is the west point of entrance to the Karluk river; there is a small settlement on it.

Karluk bay is a shallow arm to the north-east of cape Karluk. The beach descends very gradually from a low spit; at a distance of a cable from the shore the depth is several fathoms, and there is very little good holding ground for vessels.

Karluk spit separates the bay from the river valley, it is about three-quarters of a mile long, with a width of from 100 to 30 yards, and in severe storms the sea washes over it into the river. There are extensive salmon canneries on this spit.

Karluk head, about one mile to the south-west of the river mouth, rises almost perpendicularly to a height of from 1,500 to 2,000 feet.

*This description of Lazy bay does not agree with the plan; caution is therefore necessary.

See charts, Nos. 1,499 and 1,500, and plan, Lazy bay on No. 1,915.

Tides.—The range of the tide in the Karluk river is from 3 to 5 feet, while on the beach outside it is from 12 to 18 feet.

Uyak bay, consists of two arms, one of which extends 27 miles to the south-east. There are some fine harbours for fishing vessels in the bay, and inside the small island on the western side is a good anchorage, used by the Karluk boats when driven by heavy weather from off cape Karluk.

Uganuk bay.—There is good anchorage in this bay between Uganuk and Noisy islands.

Trinity islands—Tugidak island.—Heavy breakers have been reported extending 12 to 15 miles off shore from the middle of the east side of Tugidak to the south end of that island. Numerous statements tend to show that shoal water exists for 10 miles in a south and west direction from Tugidak island.

A dangerous sunken rock with 2 fathoms water on it, lies with the south end of Tugidak island bearing N. ½ E. (N. 6° E.) about 4½ miles; no indications of broken or discoloured water have been seen within a distance of 3 miles inshore of the rock.

It is also stated that a dangerous rock lies with the south end of Tugidak island bearing East at least 7 miles.

Tugidak island is very low and marshy, surrounded by foul ground, and should be approached with caution. Extensive shoals extend to the southward and eastward of it.

Sitchinak island is really two islands very close together, the west part is low, the eastern part much higher. This island is surrounded by foul ground, except on the north side. There are two pairs of small rocks above water about one mile E.N.E. (N. 67° E.) from the east end of the island.

Semidi islands.—It is reported that either these islands are very much out of place or that the positions of other islands and points on the mainland are incorrectly charted. The group consists of two principal islands, Aghiyuk and Chowiet, with several smaller ones, very high and close together and surrounded by rocks above and below water. The main channel between these islands is about 5 miles wide. The north end of Aghiyuk is said to be in latitude 56° 15′ N., longitude 156° 53′ W., and the south end in latitude 56° 11′ N., longitude 156° 53′ W.

See charts. Nos. 1,499 and 1,500.

Lighthouse rocks.—This group consists of several detached barren rocks, the largest being 90 feet in height and 500 feet in length, and others nearly awash on which the sea breaks. They are about a quarter of a mile across and can be approached with safety to half a mile. A large rookery of sea lions exists here.

Chirikoff island is irregular in shape, the west side is low and flat, the south-east side consists of high steep cliffs. The west coast is very foul, the Nagai rocks extending several miles from the shore. There are anchorages, off the north-east end; in the south-west to the southward of West point (this is small); and to the northward of the Nagai rocks is another small anchorage with a good lee in winds from South to East. Observation spot, near West point, is in latitude 55° 48′ 22″ N., longitude 155° 42′ 51″ W.

Anchorages.—The following are some convenient anchorages:—

Ujut bay, Afognak island.—On the west side of the bay.

Marmot bay.—At the east end of Northern strait.

Narrow strait.—Off the settlement near the west end of Spruce island, and between it and Kadiak island.

St Paul harbour.

Chiniak bay.—In winds from S.E. to West.

Ugak island.—Off the north-west and north-east ends of the island on either side of the sand point.

Ugak bay.—There are rocks in the entrance which can be easily avoided in moderately clear weather.

Kiliuda bay.—Several good harbours in this bay.

Port Hobron.—The second bay inside cape Barnabas. There are other harbours on the north-east and south-west sides of Sitkalidak island.

Old harbour.—About 4 miles north of the bay of Three Saints, surrounded by land of moderate height and not liable to violent squalls.

Lisianski bay.

See charts, Nos. 1,499, 1,500, and plan of South-west anchorage. Chirikoff island, on No. 1,454.

Bay of Three Saints.—Surrounded by high land and subject to furious squalls (woollies) in bad weather.

Kiyavak bay.—There are several anchorages in this bay.

Alsentia bay.—Open to north-east winds which send in a heavy sea.

Russian harbour.

ALASKA PENINSULA, SHUMAGIN, SANNAK AND UNIMAK ISLANDS.

VARIATION IN 1895.

Humboldt harbour - - - - - - 20° 0′ E.

Decreasing 4′ annually.

SHUMAGIN ISLANDS.—Banks.—A rocky bank of small extent, with 27 fathoms of water on it, is reported to lie with the highest point of Simeonoff island bearing W.S.W., distant 15 miles: and a bank with 23 fathoms on it 1½ miles to the eastward of the above bank.

A shoal with 7 fathoms on it is reported to exist with Simeonoff island bearing between N.W. and W.N.W., and distant 20 to 35 miles.

Big Koniushi island.—A rocky ledge lies close to and round the points on the east side of Yukon harbour entrance, and there are two rocks above water close off the east end of Hall island.

Little Koniushi island.—Sandy cove is a good anchorage in all but south-east winds.

Castle rock is high, rugged and serrated.

Nagai island.—Wedge cape, in latitude 55° 19′ N., longitude 159° 48′ W., is a sharp, low, wedge-shaped point.

Fishing stations consisting of a small wharf, and a few houses exist at the following places:—

See charts, No. 1,500; No. 1,454, Shumagin islands, and plan, Yukon and North-west harbours.

Red cove, Popoff island. There is a reddish yellow cliff at the east point of this cove.

Unga island. A few hundred yards north of the north head of Delaroff harbour. There is also a mining town of several houses on the north shore of this harbour.

Nagai island. Porpoise harbour.

Nagai island.—Sanborn harbour is very snug ; a vessel entering should anchor directly she is in 10 fathoms as the water shoals rapidly towards the head of the bay. The williwaws are very strong in this harbour. Cod may be caught at the anchorage, and good sport may sometimes be obtained on shore shooting ptarmigan.

The observation spot is in latitude 55° 7′ 36″ N., longitude 159° 56′ 6″ W.

Popoff strait may be entered at either end.

The south entrance is clear of dangers, while Unga reef, Popoff reefs and the 15-feet patch lying between Unga reef and Range island make the north entrance rather difficult.

Sand point, or Sandy point as it is usually styled, (Humboldt harbour), is a port of entry with a deputy collector and a post office. It is used by sealers and fishermen and also for the clearance of shipments of ore mined on Unga island.

The regular steamer between Sitka and Unalaska calls here.

Coal can occasionally be obtained.

Buoys.—A red buoy has been placed on the east side of Unga reefs, and a black buoy at the rocky patch about 2 cables to the eastward. These are private buoys.

Light.—A private light is maintained on the north side of Humboldt harbour ; it shows white between the bearings of N. 12° E. and N. 28° E., red between N. 28° E. and N. 86° E., and is obscured in other directions.

South channel directions.—Pass about three-quarters of a mile to the westward of the Egg islands, as there are a few rocks at the south point of the eastern Egg island with indications of shoal water there, and steer for Sand point. Pass Sand point at the distance of

See charts, Nos. 1,500, 1,454 and plans of Humboldt and Sanborn harbours, on No. 1,457.

2 cables and steer for the white buildings at the north end of the harbour; anchor as convenient at not less than 2 cables from the wharf at the north side of the harbour.

At night, on sighting the red light at once steer for it until abreast Sand point, when alter course parallel to the shore until the white light opens, then anchor.

UNGA ISLAND.—Zachareffskaia bay.—The reef at the western side of the entrance to this bay extends off for a distance of about a quarter of a mile further than shown in the chart. There are some weedy shoals on the eastern side above water.

Scotland rock, between Karpa and Korovin islands, is sunken and is usually marked by a breaker. It is not advisable to pass between Karpa and Korovin islands except in clear weather, as the position of Scotland rock ought to be considered doubtful.

Gormans and Korovin straits (the latter between Korovin and Popoff islands) are clear of dangers and very deep.

High island is a high rock of columnar formation.

Henderson island, in latitude 55° 26′ N., longitude 160° 19′ W., approximately, is low and flat.

Unga strait.—The coast of Alaska peninsula is incorrect on the chart. Beaver bay exists and is a large commodious harbour well protected from winds from West round by north to East, and affords good anchorage in from 8 to 15 fathoms. The centre line of the bay lies in a N.N.E. and S.S.W. direction. Cape Aliaskin, the eastern entrance point, is about 6 miles W. ½ N. from Gull island, north of Unga island. In the neck between Beaver and Portage bays are two or three lakes. No opening, where Otter bay is marked on the chart, could be seen at a distance of 4 miles; it is probably a lagoon or lake.

Wosnessenski island is high and covered with grass. The north-east point is a high, almost perpendicular bluff; the north-west point is low; in the centre of the island is a single conical peak, from which a ridge extends to the south-westward, and the south-west point is low but well marked by a sugar loaf shaped rock.

Ukolnoi island is high and undulating; its north-east and north-west points are low.

See charts, No. 1,500 and No. 1,454.

Dolgoi island.—Bluff point is a rounded head with a steep bluff to the northward, the land to the south of it being much lower. Cape Baum is a low projecting bluff with low land to the eastward of it.

Goloi island lies close to Dolgoi island and is not seen, when coming from the north-east, until well up with cape Baum.

Cape Moss (not marked on chart).—There is a single needle rock, close in shore, off this cape. Further to the southward is a square-headed rock, which is not seen until nearly abreast Goloi.

Iliasik islands.—The inner Iliasik island is formed of two high hills connected by low grassy land and appears at a distance as two islands. The northern hill from the southward very much resembles a saddle with high cantle and no pommel. The southern part of the island is wedge-shaped extending to a point off which are a few islets. A reef extends 100 yards from the south end of inner Iliasik island, which is in about latitude 55° 2′ N., longitude 161° 55′ W.

A reef extends from the north-west end of inner Iliasik island to the mainland, the greater portion of which shows at low water. A pinnacle rock lies on the reef about 60 yards from the mainland, immediately to the south-west of which is a narrow passage, sometimes used with a fair wind at high water by small craft.

Approaching the strait between the inner and outer Iliasiks from the eastward, two islets will be seen at the western end of the passage and apparently in mid-channel; these islets lie on the south side of the channel and are a part of the flat extending from the north-west point of the outer Iliasik, which island is a high ridge trending in a N.E. by E. and S.W. by W. direction, descending to comparatively low land and then ascending to high hills at the southern end. The least water in the strait found by a vessel passing through in mid-channel was 8 fathoms.

Track.—The usual course for the inside passage from Sand point is along the Alaskan peninsula, leaving Gull, Jude, Wosnessenski, Ukolnoi, Dolgoi and Goloi islands to the southward, passing between the inner and outer Iliasiks, leaving Dear and Fox islands to the southward, thence going between Amagat and Umga islands, and rounding cape Pankoff at a distance of about 1½ miles.

BELKOFFSKI BAY.—Belkoffski is, next to Unalaska, the largest native settlement west of Kadiak, having a population of 160, which is supported by sea-otter hunting. The best anchorage for a stranger is in about 10 fathoms with the church bearing W.N.W. (N. 67° W.). There are large boulders in the western part of the bay, which is open from south-west to south-east.

Bailey harbour has an inner and an outer bay divided by a broad shingle spit, which extends nearly two-thirds across from the west shore. The inner harbour is entirely landlocked and affords secure anchorage in 5 to 8 fathoms anywhere near its centre. There are large boulders at the head of the bay and along the western shore. To enter the outer harbour close the eastern shore, as the flats on the opposite side extend out some little distance, and for the inner harbour take a mid-channel course through the narrow entrance between the extremity of the spit and the eastern shore, carrying about 9 fathoms, the water shoaling after entering.

The harbour not having been examined it will be prudent to anchor on the inner side of the spit in from 6 to 8 fathoms.

Thin point, in latitude 54° 59′ N., longitude 162° 39′ W., is a low flat point.

Amagat island from the north-east appears as two rounded high hills.

Unga island.—There is but one Unga island, which bears [illegible] N. from cape Pankoff. Rush rock lies about 2 miles E.N.E. from Unga island.

Sannak islands.—The main peak of Sannak has been seen from a distance of 65 miles to the westward. The most noticeable features of Sannak are the closely connected peaks eastward of Acherk and the numerous out-lying rocks and islands. The rest of the island seems to be low hills and undulating land.

The island seems to be important in the fishing industry and as a resort for sealers; there are stations at Acherk, Pavloff harbour, Caton cove and Petersen bay.

Petersen bay and Caton cove are reported to be good anchorages, but Salmon bay, east of Petersen bay, as rocky and dangerous.

There is a fishing station on Lida island.

The entrance to Caton cove is to the westward of Lida island. There are rocks about N. ½ W. (N. 6° W.) 9 miles from the north-west point of Caton island.

The neck connecting Petrof peninsula, on the west side of Acherk harbour, with the main part of the island is low and covered at very high tides.

Acherk is said to be a good harbour for all but north-west winds. There are several native houses in the south-east part of the harbour visible from a considerable distance when not shut in by the hill on Petrof peninsula.

The best landing is on a beach near the village; there is a wharf in the south-east corner of the harbour.

Rocks.—There is a rock awash at low water in approximately latitude 54° 3′ N., longitude 162° 48′ W., or with mount Sannak bearing N. by W. ¾ W. (N. 20° W.). This is probably the Anderson rock, previously placed on chart No. 1,500, about 5 miles south-westward of the above position.

The existence and positions of the Anderson and Lenard rocks are doubtful; they are believed to be one and the same rock though reported in different localities. Lieut.-Commr. Tanner, of the U.S.S. *Albatross* has searched for them without success, but he is convinced that some danger exists in that locality.

It is reported that foul ground exists between the above mentioned rocks and Sannak islands.

Aleks rock.—A sunken rock, about 20 feet across, and on which the sea breaks, lies with mount Sannak bearing approximately N.E. (N. 45° E.) distant 26 miles.

UNIMAK.—Cape Pankoff has three rugged points close together and there is a reef above water extending about a quarter of a mile E. by S. (S. 79° E.) from the middle point. Cape Lazareff is a rocky point with a ledge extending S.E. (S. 45° E.) about one mile; there are three rocks above water nearly equidistant from the cape. There are two bold rocky points immediately eastward of cape Lazareff, with small beaches between them.

Promontory cape has a small rocky islet off it.

Cape Khituk (or Seal cape), the south-eastern extremity of Unimak island, is about 150 feet high, with a vertical rocky face and grassy slopes on either side.

There is no island off this cape. A steep hill, about 500 feet in height, lies a mile eastward of the cape; its slopes extend to the water's edge and furnish a good landmark.

Shaw bay.—This bay at its western end is 3 miles deep and affords shelter from all winds except between north-west and north-east. With northerly winds breakers extend far out, as the bay is shallow. The best anchorage is in the south-west corner of the bay with the western point bearing about W. by N. (N. 79° W.) 2 miles, in from 6 to 9 fathoms, sand. Landing is not practicable even in a moderate swell, the best landing place is on the rocks just before they join the sand beach. In 1893 there were brown bears, reindeer, wolves and foxes, also numbers of ptarmigan and wild duck here.

Shisaldin peak is a volcano, very prominent and most symmetrical. It is in latitude 54° 50′ N., longitude 163° 56′ W.

BERING SEA.

Winds.—In Bering sea, unusual clearness of the air with a falling barometer is almost invariably (in the summer months) followed by a strong S.E. gale, with rain, which usually lasts about 12 hours, the wind shifting to S.W. when the barometer ceases to fall; but sometimes it backs from S.E. to N.E. During July, August, and up to the middle of September, the weather is by no means bad at the Aleutian islands, it is worse at the Pribiloff islands. In the spring, southerly, and in the autumn, northerly winds are said to prevail.

Currents.—The currents in Bering sea are greatly influenced by the winds, little current is as a rule experienced when 10 miles clear of the land. In the spring, on the west shore of the sea, the current sets north-east well off shore, and although its rate is increased or diminished by the prevailing winds, it is seldom that the current changes to the southward. In 1886, during a north-east gale, a vessel furled sails and made fast to a floe of drifting ice off cape Navarin, and in three days was taken by the current 45 miles to windward. The current is said to split about 30 miles off cape Navarin, one branch following the trend of the coast in a south-west

See charts, Nos. 2,459 and 2,460.

direction, the other running to the northward into the gulf of Anadyr and then to the north-east, being strong between St. Lawrence island and cape Tchaplin. On the east side of Bering sea, between St. Matthew and Nunivak island, the set of the current is to the northward. With prevailing north-east winds, it sets north-west, and with north-west and south-west winds, north-east. This northerly current continues past the east side of St. Lawrence island to King's island, from there it sets towards port Clarence, and then follows the trend of the coast. In Bering strait, the current sets north and when not influenced by wind, its rate is about 2 knots an hour. Protracted northerly gales, which prevail in the autumn, change its direction to the southward, but on the cessation of the wind it quickly sets north again. Strong southerly gales increase its rate to 3 knots.

Tidal streams.—In the southern part of Bering sea, inside the 100 fathoms line and through the various passes in the Aleutian islands, the tidal stream sets to the north or north-east during the rising tide, and to the south or south-west during the falling tide. In some of the passes it runs at a rate of 6½ knots an hour, when clear of the passes its maximum rate is about 2½ knots.

Ice.—The general southern limit of ice is said to be from Bristol bay to about 35 miles south of St. George island, thence trending to the north-westward, but it has extended to the Akutan pass (in January 1878) where it only remained a few days. The Pribiloff islands are in some years free from ice, but it usually appears there during the latter part of December, and remains till about the beginning of May. Heavy and solid ice probably does not extend to the southward of St. Matthew island, while the ice between that island and the southern limit is made up of newer ice and detached floes of well broken ice.

See charts, Nos. 2,459 and 2,460.

VARIATION IN 1895.

Dutch harbour, Unalaska - - -	17° 30′ E.
Decreasing 3′ annually.	
Chichagoff harbour, Attu island - -	8° 30′ E.
Nearly stationary.	

FOX ISLANDS PASSES.—From the southward and eastward, bound for Bering sea, there are three passes known as the Fox islands passes, and respectively as Unimak, Akutan and Unalga passes. The largest and most desirable one to use in foggy and thick weather is the eastern, Unimak pass. This is clear of hidden danger and the widest of the three. The next to the westward, Akutan, is said to be clear of hidden dangers in mid-channel though it is probable that its shores are more or less foul. It might be used as an alternative pass should it not be convenient to reach or go through Unalga. Unalga pass is the smallest, shortest and most convenient for the purpose of making Captains bay. It has the disadvantage of being narrow for sailing vessels.

In approaching the Fox islands passes from the southward, discoloured water will be found upon the Davidson bank, upon which shortly after noticing the discolouration a depth of 100 fathoms will be found.

Unimak pass.—Approaching the Unimak pass from the south-eastward, the south-west end of Unimak island, a little to the eastward of cape Khituk, affords an excellent landmark. The land is high, and in clear weather, may be seen a sufficient distance for a course to be shaped to any of the Fox islands passes; in thick weather, as the coast is bold and fairly free from outlying danger, it may be approached near enough to be seen and the position obtained. Tigalda and Ugamok islands are both fringed on their southern sides by reefs, making it unsafe to approach them sufficiently close to make the land in thick weather, besides, the tidal streams to the westward of cape Khituk are strong and irregular. When the fog lies low bearings may sometimes be obtained of Shishaldin or Pogrumnoi mountains.

See chart. No. 1,500.

Ugamok.—The sharp peak on the north-east point of this island is conspicuous, and may often be seen when the summits of the higher islands in the vicinity are obscured by fog.

Ugamok pass, between Ugamok and Tigalda, is quite blocked up with islets and reefs and is impassable.

Tigalda island is high and prominent, with rounded hills resembling knuckles; it should not be approached within 3 miles, as rocks are said to extend from it, especially from the south-east point.

Avatanak island.—The eastern end of this island is highest and ends in a bold cliff; towards the western end, which is low, is a pile of very prominent rocks resembling a ruined castle.

Akun cove is large and easy to approach; heavy williwaws are experienced here. There is a great quantity of drift wood on the shore. In 1893, there were red and blue foxes on Akun island and a few wild duck and eagles were seen, but no ptarmigan. Middle point is in latitude 54° 17′ N., longitude 165° 39′ W. approximately.

Akutan island and volcano is a good landmark both from Bering sea and the Pacific. The top of the volcano, which is at times active, is generally obscured by clouds, mist and smoke. The lower parts of this island are sometimes clear when Unalaska is hidden by fog and rain; cape Morgan, the south-west point, is very bold and precipitous; a reef extends from it, and there are three pinnacle rocks about 2 cables off it.

Akutan harbour is about 4 miles long and one mile wide and is apparently free from dangers. The water is deep, 19 fathoms having been found two cables from the head of the harbour and 20 to 25 fathoms elsewhere. It is possible that there may be shoaler water and suitable places for anchoring. The harbour gives protection from all winds, but it is said that the williwaws are violent. There is a depôt of the Alaska Commercial Company at a village on the north shore.

Akun pass, between Akun and Akutan islands, is said to be foul. It is hidden when approaching from the eastward by a small high island, opening from the southward when past that island.

Akutan pass.—The islets in this pass are moderately high, with many detached pinnacle rocks above water. From a vessel going

See chart, No. 1,500, and plan Akun cove on No. 1,454.

through in about the middle, no bottom was obtained with the hand lead, and although the sea was breaking right across, the wind opposing the tidal stream, no dangers were seen except the reef, which extends for some distance off cape Morgan.

Unalga island is comparatively low and is the last land to be made when coming from the southward. It has a low break in the centre, giving it the appearance of two islands; it is very green with red earth cliffs, and shows up well either against the fog or the dark hills beyond.

Egg island, in about latitude 53° 54′ N., longitude 166° 5′ W., is moderately high, rather jagged on top and dark in colour. There is a good passage between cape Biorka and Egg island, with 35 fathoms water.

The Signals are two low barren rocks, they are visible a considerable distance. The channel inside them is clear, with a depth of 10 fathoms.

Biorka island is the southern boundary of Beaver inlet, a deep inlet just to the west of the southern entrance to Unalga pass. There are several bays leading out of Beaver inlet affording fair anchorage; the water is deep, which requires anchoring near the shore; care should be taken not to anchor in the vicinity of sunken rocks on the coast. The best anchorage is said to be near the north side of the inlet near its eastern entrance.

UNALGA PASS.—All the points of Unalga island and Unalaska island at Unalga pass have reefs of rock, visible above water, extending a short distance from them. The cliffs on the western side of the pass are dark and precipitous, and a vessel passing through would recognize them in a fog, by a curious vein of bright red colour which runs through them in a horizontal direction.

A course through the middle of the pass is the most prudent one. English bay to the south-west of Unalga island is a good harbour.

In the middle of the pass are depths of 25 to 35 fathoms between Unalga and Unalaska and deeper water to the north-west and south-east.

Williwaws of great force are sometimes experienced in the pass.

Tides.—It appears to be high water at about the same time as at Captains bay. *See* page 48.

See chart, No. 1,500.

Tidal streams.—The stream runs to the south during the falling tide and to the north during the rising tide. It is probable that the south-going stream runs longer and with greater strength than the north-going, as it is said that several vessels hove to in thick weather in the Bering sea have been set through the passes into the Pacific without being aware of it. With each tidal stream, a heavy race exists at the spot, where the stream reaches deep water after going through the pass. This race is sometimes very heavy, especially when a gale has been blowing for a length of time.

It is advisable, if possible, to go through at or near slack water. In the pass with a gale of wind and an opposing stream, quite a sea arises and presents an appearance of breakers. The rate of the stream varies, but it has been found to run 6½ knots an hour during the whole of the tide, and the stream turned to the opposite direction at the same rate in 20 minutes. In H.M.S. *Nymphe* in 1893, all hatchways on deck were obliged to be closed, as the water broke on board in every direction with great force, and a speed of 9 to 10 knots was necessary to command the ship. Captain Evans of the U.S.S. *Yorktown*, says: "I left Unalaska with a hard N.W. gale blowing and a tremendous sea. In the pass it was the grandest thing I have ever seen at sea, but most uncomfortable. The sea broke all over the ship and as high as the top of the smoke stack. The ship came through, but I did not want any more of it."

UNALASKA ISLAND.—Captains bay.—Cape Kalekhta, in latitude 54° 1′ N., longitude 166° 24′ W., has a shoal extending to the northward from it and should be given a berth of 1½ miles.

Priest rock is a high pinnacle and an excellent mark, but it does not open when coming from the southward till it bears about W.S.W. and it is sometimes difficult to distinguish from the cliff behind it when not open. There is a somewhat similar rock off Erskine point, about 3 miles to the eastward, which must not be mistaken for Priest rock.

When coming from the eastward, Priest rock and the coast line to the southward are in line, the shoals and rocks off cape Kalekhta are cleared, but it is advisable not to haul into the bay until the south side of Summer bay is open of the south head of Constantine bay.

The cascade to the southward of cape Cheerful is a conspicuous mark and particularly useful in thick weather when only the lower parts of the land can be seen. Approaching cape Cheerful from the

See chart, No. 1,500, and plans, Captains bay and Iliuliuk harbour, on No. 1,457.

northward or westward, allowance should be made for a current in its vicinity of about $\frac{1}{10}$ knot an hour to the eastward.

Between Pinnacle rock, at the south side of Summer bay, and the spit on the east side of Dutch harbour, there is a ridge of irregular soundings extending across the bay, on which there may be less water than shown on the charts. The deepest water is to the eastward of the middle line of the bay.

Amaknak island.—The north end of this island is like a pyramid with the top cut off, and is very remarkable when entering the bay.

DUTCH HARBOUR.—Beacon.—There is a white wooden beacon, 15 feet high, on Spithead; it is of lattice work in the form of a triangular pyramid.

Buoy.—A black spar buoy is moored at the north end of the shoal extending from Rocky point.

Jetty.—A jetty 300 feet long and 200 feet across the T end, with depths of 21 to 28 feet at its outer end, and 18 to 25 feet on the inside of the T (where there is room for a small vessel to coal), has been constructed on the south side of Dutch harbour. Large ships can lie at the outer end.

There are several buildings at the inner end of the jetty, the store houses and coal depôt of the North American Commercial Company.

Supplies.—Coal in considerable quantities can be obtained at $10·20 per ton. The stock is usually about 1,000 tons. It can be put on board a vessel lying alongside the jetty at the rate of 300 tons a day.

Water can be obtained from an iron pipe at the wharf at the price of $\frac{1}{2}$ cent per gallon; it comes from a small lake on Amaknak island.

No fresh provisions can be obtained, though there is a good store belonging to the North American Commercial Company.

The best place for seining in the harbour is in Summer bay where a party can ensure a good catch of salmon.

Communication.—A small steamer runs between Sitka and Unalaska, and leaves Dutch harbour monthly from April to October inclusive. This steamer connects at Sitka with the Pacific Coast

See chart, No. 1,457.

Steamship Company's steamers. The Alaska Commercial Company have also a steamer running to port Townsend and San Francisco during the season.

Directions.—Entering the harbour, round Spithead at a distance of 100 yards and anchor in 16 fathoms off the jetty. The best anchorage in all weathers is nearer the western shore of the bay, and nearly opposite Spithead.

In the bay outside the best anchorage is about 2 cables to the northward of the rocky islets at the entrance to Iliuliuk harbour.

Iliuliuk harbour.—Buoys.—A red spar buoy marks the eastern end of a shoal off the eastern rocky islet at the entrance to Iliuliuk harbour, and an iron barrel buoy about 30 yards southward of the spar buoy marks a 3¼ fathom patch. These buoys are maintained by the Alaska Commercial Company.

Coal can be obtained in Iliuliuk harbour, but not in such quantity or with such facility as in Dutch harbour. The usual stock is about 400 tons.

Position.—The observation spot, Iliuliuk harbour, is in latitude 53° 52′ 54″ N., 166° 31′ 44″ W.

Water can be obtained at the wharf, and boats can water on Amaknak island opposite the wharf.

Anchorage.—In Iliuliuk harbour the only anchorage is in the middle of the harbour in line with the south side of the wharf. Although this is good holding ground and landlocked, in bad weather the squalls come down from the high land with such force and such changes in direction as to be dangerous, and it is recommended on indications of a coming blow that a vessel should shift into the outer harbour, where there is room to veer sufficient cable to enable her to ride in safety, as unless moored there is but little room in Iliuliuk harbour. Williwaws are frequent in this locality and render the anchorages very uncomfortable.

Landing.—There is landing for boats on both sides of the wharf in Iliuliuk harbour, but the water is shoal on the north side.

Tides and tidal streams.—At Captains bay it is high water, full and change, (mean establishment), at 3h. 50m. The terms spring and neap rise cannot be used. The extreme range of tide is 5 feet;

average range 2 feet 2 inches; the diurnal equality is sometimes 3 feet 9 inches. The tidal stream in Dutch harbour does not exceed half a knot an hour and in Iliuliuk harbour one knot. The wind does not cause any increase in height of tide, and has little, if any, effect on the tidal streams.

Wislow island is a small round island with a green top situated in a bay about 2 miles westward of cape Cheerful, it is a conspicuous and useful mark.

Three miles to the westward of Wislow island is a remarkable square-shaped rock called the Irishman's hat.

Cape Gattan, 1½ miles northward of Volcano bay, is a rounded hillock 400 feet high; it appears like an island and is very remarkable.

Makushin bay.—Good anchorage can be obtained in the first inlet on the north side of Makushin bay, off the village, which consists of a church, five wooden houses and some sod huts. Anchor with the church, a white building, bearing West and a high detached rock, named Priest rock, S.W. by S. (S. 34° W.) in 14 fathoms. A small river runs into the sea a quarter of a mile eastward of the village and a shoal, with a depth of 15 feet on it, extends a cable from the shore off the mouth of the river. A quarter of a mile inside Priest rock a rocky ledge runs out in a S.S.E. direction for about one cable, terminating in a small rock above water.

Off the north entrance point of the bay, there is a rocky islet 30 feet high, 1¼ miles from the shore in a south-west direction and between it and the shore are several pinnacle rocks above water.

Chernoffski harbour.—Chernoffski village, a station of the Alaska Commercial Company, in latitude 53° 26′ N., longitude 167° 32′ W., is situated on the shingle isthmus at the northern end of the harbour and consists of a church which is a white building with a red roof, three storehouses and about a dozen huts. There are no resources whatever. Water may be obtained in abundance, but with difficulty, by boats at the mouth of the shallow creek in the southern part of the bay. There are no trees. Firewood is scanty, obtained from driftwood thrown upon the beach. In 1893, H.M.S. *Champion* obtained some poultry here, there were plenty of ptarmigan and some wild duck, also some salmon and trout were good and abundant. There were no salt water fish in the

See chart, No. 1,500, and plan, Chernoffski harbour on No. 1,454.

harbour, but one mile at sea they were plentiful. The usual landing is on the beach, 50 yards eastward of the flagstaff.

The entrance to the harbour is a narrow channel, formed by low promontories, which towards the sea are rugged and bare, and towards the entrance partly smooth and grassy. There are several detached rocks off the entrance points showing above water. About half a mile westward of the church, there is a wide, deep cut through the promontory, visible from seaward. The eastern side of the anchorage is formed by high hills, which ascend to the mountains of the interior, it trends for over a mile from the village in a south-easterly direction to a point where there is low, marshy ground.

At the extreme southern part of the harbour is a shallow bay into which a small creek empties, draining a number of lakes of a deep valley. From the western side of this valley the land is high, trending in a north-westerly direction three quarters of a mile to a bare shingle point, thence the land trends in a westerly direction to a small bay and from this bay in a north-west direction to West point at the entrance. This is a most excellent anchorage and there is room for a large number of ships to lie at anchor; it is sheltered from all winds.

Directions.—Approaching from the north or eastward make cape Neil Juan, a high bold promontory with projecting pinnacle rocks, about 3 miles to the north-east of Chernoffski church. Then keep the coast aboard till the church, which is conspicuous, is seen, when the entrance to the harbour will readily be made out. The deep cut in the cliff also well marks the locality. Round East point at a distance of not less than a quarter of a mile and proceed about E.S.E. through the middle of the channel into the harbour. Round Observatory point, the low shingle extremity of the eastern promontory, at a distance of about one cable and anchor in 10 to 12 fathoms, mud, in mid-channel, midway between Observatory point and the church.

Tide.—There is an approximate rise of 7 feet at neaps.

Unalaska, S.W. and South coasts.—About 5 miles inland from the south-west end of Unalaska is a single conical peak about 2,000 feet high, which is remarkable as the land in the vicinity is comparatively low.

See charts, Nos. 1,500 and 1,454.

The south coast of Unalaska island extends some miles further south than shown on the charts at present (February 1895) and should be approached with much caution.

Umnak pass.—A good view was obtained from H.M.S. *Champion* through this pass; it appeared to be clear with an island about 300 feet high in the north entrance. It is however, reported that there are rocks at the south entrance to the pass.

Bogosloff islands.—These are two islands, both about 800 feet high, lying in a north-west and south-east direction from each other, 1¼ miles apart with shoal water between them. New Bogosloff (the northern island) is square in shape, volumes of steam issue from it, and the water is disturbed on its eastern side. Old Bogosloff is apparently not active, large numbers of sea lions assemble on it. On the east side of these islands, shoal or discoloured water extends about 1½ miles from them. In 1882 an eruption occurred which considerably altered the shape of New Bogosloff.

The proximity of these islands, while hidden in dense fog, has been detected when several miles to leeward of them by a smell of sulphur and guano. The birds in this vicinity are numerous. It is reported (1895) that Bogosloff is now only one-third of its original height

UMNAK ISLAND.—The north-west extreme of Umnak island terminates in a long low point. The north coast of Umnak island should be approached with much caution; the south-west extremity of the island and the coast westward of Nikolski should be avoided.

Vsevidoff volcano, in latitude 53° 4′ N., longitude 168° 31′ W., is 7,236 feet in height; it is a snow-covered cone sloping to the sea from north to south-west. There are no mountains on the island south of it.

Between Adugagh island and the northern side of the south-west part of Umnak there are numerous outlying reefs, and the tidal streams are strong.

Nikolski.—There is landing at Nikolski on a shingle beach inside the reef, the boat passage is to the right of the reef and there is a sunken rock, with a little floating kelp on it, in the channel. The church open of a yellow roofed house and midway between the house and the right point of the reef leads in clear of the rock.

See chart, No. 1,500.

The outlying island is about 5 miles northward from Nikolski and about 1¼ miles off shore; it is about 100 feet high, and 1¾ miles long north-east and south-west.

The south-west extreme of this island is in latitude 52° 55′ N., longitude 168° 45′ W. The passage between this island and Umnak is foul.

There is anchorage about S E. ¼ E. (S. 48° E.) 4 miles from the south-west extremity of the off-lying island.

Samalga island is low and sandy. The channel between it and Umnak appears dangerous.

Islands of Four Mountains.—This group consists of five islands, instead of four as hitherto supposed, the fifth being a volcano 5,290 feet in height and about 5 miles to the southwest of Chudinadak island.

A reef, which breaks heavily, extends 1½ miles south-eastward from the south-east point of Chudinadak island; this is the only known danger in the group, and the passes between the islands appear to be safe.

Anchorage has been obtained on the east side of Chudinadak island.

The tidal streams are strong; a stream running to the south-west at a rate of about 5 knots an hour has been experienced off the reef at the south-east point of Chudinadak island.

Chudinadak rises to an elevation of 8,150 feet.

Yunaska island.—This island is charted 4 or 5 miles north and and west of its position. The north-west extreme of the island is in lat. 52° 37′ N., long. 170° 43′ W.

Amukta island.—There is a high rock about one mile southward of this island.

Siguam island.—Rocks and discoloured water extend for 1½ miles off the east and west ends of this island.

Western Aleutian islands.—Caution.—Mariners are warned that the positions of many of these islands, as placed on the charts, are open to question.

Atka island.—Nazan bay.—Bomehoi island in this bay is very high, and the rocks north of it are from 60 to 120 feet high.

It is high water, full and change, in Nazan bay at 10h. 30m., and there is one tide in 24 hours.

See charts, Nos. 1,500 and 1,501, Siguam island to Attu island, with plans.

There is good fishing in the bay, and also in the pass between Atka and Amlia islands.

The pass between Atka and Amlia islands is safe in mid-channel.

Amatignak island.—This island is reported to be 4 miles south of its position on the chart.

Rat islands.—A reef with kelp on it, and on which the sea broke, has been reported between Kyska and Chugal islands in approximately lat. 52° 8½′ N., long. 177° 52′ E.

Near islands.—Attu island.—A dangerous sunken rock, with 2½ fathoms on it, lies in the fairway of Chichagoff harbour entrance, with the flagstaff and Range point in line, and distant about $1\frac{2}{10}$ miles from the flagstaff. And two rocks, with depths of 1¾ and 2½ fathoms over them lie close together with Pisa tower rock S.E. (S.45° E.) 3 cables.

Good fresh water is to be obtained here.

Agattu island.—There is anchorage in westerly winds in McDonald bay at the eastern end of this island, and the following directions are given when approaching the bay from the northward. With North-east cape bearing S.W. ½ W. (S. 51° W.) distant 3 miles, steer S.S.W. (S. 22° W.) until the cape bears W.N.W. ½ N. (N. 67° W.), then steer S.W. by W. ¾ W. (S. 65° W.) for Monolith point. Anchor with Cone peak bearing N.W. (N. 45° W.) in 15 fathoms, [illegible] bottom, about half a mile off shore. North-east cape is in lat. 52° 26′ N., long. 173° 30′ E. approximately.

PRIBILOFF ISLANDS.

VARIATION IN 1895.

St Paul - - - 16° 30′ E.

Otter island is high and cliffy at its west end, sloping gradually to its east end on which there are two small craters. Foul ground extends to about three quarters of a mile around the island, to the southward, south-westward, and north-westward. The north side from Crater point to North-west reef is clear of dangers. Probably the best anchorage near the island is in 9½ fathoms, black sand and broken shells, with the north-east extreme of Crater point bearing S. by E. (S. 11° E.) distant about half a mile. This island must be approached with great caution in thick weather.

See plans, Chichagoff harbour and McDonald bay on No. 1,501, and Pribiloff islands, with plan, English bay on No. 1,454.

Parts of this and Walrus islands are covered with sea birds in the breeding season, and at the proper time a plentiful supply of eggs may be obtained.

St. Paul island.—When approaching St. Paul from the westward, some remarkable white patches on the cliffs just to the eastward of S.W. point are excellent marks in misty weather; from the northward, the double-peaked hill at the east end of the island, with N.E. point stretching away very low, is easily recognised.

The south end of St. Paul should be avoided during fog.

Stony point* is a dangerous ledge of rocks.

The rocks off Sea lion neck should be given a good berth. The dangerous reef north of Hutchinson hill, the N.E. point of the island, consists of two rocks marked by kelp. There are 3½ fathoms on the outer rock and 3 fathoms on the inner. The outer patch is a little less than one mile N. by W. ½ W. (N. 17° W.) from the coast of Hutchinson hill. There are depths of 4, 5 and 6½ fathoms close in to the shore, with 7½, 9 and 13 fathoms midway between the rocks and the shore. With a moderate swell the sea breaks over these rocks and off N.E. point for a short distance.

Off North hill, a shoal extends about a quarter of a mile to the northward, the depths gradually increasing to 4, 5 and 6½ fathoms at the distance of one mile from the shore. A rocky patch, with 7 fathoms water on it and 9 to 13 fathoms around, lies with Hutchinson hill bearing N.E. by E. ¾ E. (N. 65° E.) distant 3⅛ miles. There may be less water on the shoal, as the locality was not fully examined.

Anchorage.—The usual anchorage at this island is off the west side of Reef point, and there is also anchorage on the east side off Black bluffs. From the anchorage on the west side the village is hidden, but there is a flagstaff on the top of the hill overlooking the bay; from the Black bluffs anchorage the village is in full view, and there is another flagstaff, the lower of the two, on this side. If a vessel is seen approaching, the United States ensign is hoisted on the flagstaff on the side on which she ought to anchor, and the ensign is kept flying if landing is safe, but hauled down if it is not safe.

Vessels of medium draught are said to ride easier off the south side of Luckannon bay in rough weather than off Black bluffs.

* This name is not on the charts.
See charts, No. 1,501 and No. 1,454.

Vessels should not attempt to ride out a gale at anchor near the islands, unless to leeward and well sheltered.

Landing.—In Village cove, the landing place on the west side, a bar extends across the entrance which breaks unexpectedly, and is dangerous for boats.

The East landing is a small cutting in the rocks, close to a boat house, which is the only house near the beach; with westerly winds landing here is easy.

It is said that a landing can be made at the head of the cove on the south side of Lukannon bay, when impracticable at Black bluffs or Village cove. The surf is apt to make quickly and is usually dangerous on the weather side of the island.

Village.—The village consists of a number of small wooden houses, painted white with dark roofs, for the natives, there is a church, also several larger buildings for the officers of the North American Commercial Company (who in 1891 obtained a lease of the Pribiloff seals for 20 years), storehouses, &c. There were about 300 inhabitants in 1893.

Seals.—Reef point, in latitude 57° 6′ 30″ N., longitude 170° 20′ W., approximately, is one of the large rookeries and no unnecessary noise, such as firing guns, should be made on account of frightening the seals; a small amount of the steam whistle does not seem to disturb them.

Currents.—The currents about St. Paul island are very strong and uncertain.

Tidal streams.—Around St. Paul island the flood tidal stream sets to the eastward and the ebb to the westward, following the trend of the shore. Its rate at the surface is $2\frac{1}{2}$ knots an hour at springs, and one knot at neaps. Below the surface its rate is much greater. The tides and tidal streams are greatly influenced by the winds.

Walrus island is very low and a bad place to make in a fog. A reef, on which the sea breaks, extends about a quarter of a mile south from the south point of the island. The east side appears to be steep-to, but rocks, awash and under water, extend about 100 yards to the northward and north-westward of the island.

In smooth water landing on this island is not difficult.

See charts, No. 1,501 and No. 1,454.

St. George island.—Vessels should not approach St. George island to less than 12 fathoms of water.

Dalnoi point is a precipitous cliff.

A reef extends about a quarter of a mile off-shore to the southward of the anchorage in Zapadnie bay.

The anchorage in Zapadnie bay affords good shelter from E.N.E. winds. At North anchorage a red house on the beach in line with the flagstaff leads to the anchorage.

Landing is on the open beach, and at the North anchorage is much interfered with by kelp. It should not be attempted there except the sea is smooth and the wind off-shore. A flag is shown from the flagstaff when landing is possible.

The U.S.S. *Concord* anchored in 17 fathoms water, fine yellow sand bottom, with Tolstoi point bearing S.W. by W. $\frac{1}{8}$ W. (S. 66° W.), distant $7\frac{1}{2}$ miles.

Tides.—It is high water, full and change, at 5h. 49m. approximately ; rise 3 feet.

Tidal streams.—The stream sets to the eastward during the rising tide and to the westward during the falling tide, with a maximum rate of $2\frac{1}{2}$ knots.

ST. MATTHEW AND ADJACENT ISLANDS.

VARIATION IN 1895.

St. Matthew island - - - 15° 40′ E.

St. Matthew island.—From the southward and south-east it is well to make cape Upright, in latitude 60° 18′ N., longitude 172° 4′ W., which is high and vertical ; off the cape is a detached rock about 25 feet high. The land in the immediate vicinity of cape Upright is high and mountainous, to the westward of it is a low neck apparently of sand.

On the north side of the island, there is anchorage, with Sugar loaf peak bearing about S.S.W., in a bight to the westward of some outlying rocks, 10 feet above water, which should not be approached closely. This anchorage is protected from southerly winds between

See chart, No. 1454, with plan of St. Matthew island.

S.E. and S.W. Landing is somewhat difficult with any swell at all, as the beach is rather steep and of large stones.

With northerly winds anchorage can be obtained on the south side of the island.

St. Matthew island is particularly surrounded with heavy ice from the north, and probably from the east and west, as the winds prevail from one quarter or the other.

There is abundance of fresh water on the island, both streams and large fresh water lakes.

The polar bears have been all shot, but a few may be brought by drifting ice stranding on the island; in 1893 there were plenty of small blue foxes, and a few Alaska snipe; wild duck were scarce. There were no fur seals, but a few hair seals and sea-lions.

There are no permanent inhabitants.

In the latter part of June 1889, the temperature of the air was between 33° and 41°, the temperature of the sea being 35°. The summits of the hills were constantly enveloped in fog and mist, and the whole aspect cheerless and inhospitable, the wind being strong and the air damp and raw. From various accounts, the island is almost constantly enveloped in fog.

Tides.—It is high water, full and change, at 5h. 30m. approximately. The range of the tide is about 4 feet.

Tidal streams.—The flood stream sets to the eastward, and the ebb to the westward, at a rate of one to 2½ knots. Great caution is necessary when navigating in this vicinity in thick weather, especially when passing Sarycheff strait, owing to the strong tidal streams.

Sarycheff strait is said to be clear, but the rocks on either side are very nasty looking.

Hall island.—There is anchorage on the east side of this island in the bight near the ruins.

Guillemots and other sea birds are very numerous.

Pinnacle island presents, from the eastward, the appearance of two high rounded hills, with small pinnacle rocks off the north end.

See chart, No. 1,454.

NUNIVAK ISLAND.

VARIATION IN 1895.

Cape Etolin - - - 19° E.

Nunivak island.—There is anchorage in an open bay on the south-west side of this island. It is apparently clear of danger, the water shoaling from 15 fathoms about 3 miles off shore to 6 fathoms at three-quarters of a mile off, with a sandy bottom. Landing may be effected in a small stream running from a lagoon to the sea, but it is exposed and awkward. There are two or three huts, where some natives live, about half a mile up the stream.

At the anchorage at cape Etolin small craft should anchor close in to avoid the sea produced by the tidal stream in Etolin strait.

The observation spot at cape Etolin is in latitude 60° 25′ 22″ N., longitude 166° 8′ 28″ W.

The following shoals are reported:—Shoal water (4½ to 9 fathoms) extending from 12 to 15 miles off the west coast of the island.

A shoal, about 3 miles long, with 10 feet of water on it, about 5 miles from the north-west side of the island.

Breakers 6 or 7 miles from the south extreme of the island.

A shoal, with 12 fathoms water on it, about 12 miles south of the principal peak of the island. (The captain of the trading vessel reporting this shoal is of opinion that this shoal extends to the north-west along the coast of the island.)

ALASKA.

VARIATION IN 1895.

Port Clarence - - - 21° E

NORTON SOUND.—St. Michael's, in about latitude 63° 28′ N., longitude 162° 5′ W., is the most northerly settlement and trading post of the Alaska Commercial Company; it is the outlet of the Yukon trade and also the source of supplies for the country bordering upon the Yukon river and its many tributaries, reaching, in this way, a portion of the Dominion of

See chart, No. 2,460, and plan of cape Etolin anchorage on No. 1,457.

Canada, west of the Rocky mountains. The settlement consists in winter time, of the offices and store houses of the Alaska Commercial Company, with a few residences for their white employés and a small native village. In the summer, the population is augmented by traders from the river, missionaries to obtain mails and supplies, miners and natives from the surrounding country; which temporary residents live in tents.

Small, light draught stern-wheel steamers ascend the Yukon from St. Michael's for a distance of 1,700 miles, reaching the mouth of the river by an inside channel and outside coasting for a distance of 60 miles.

Steamers of the Alaska Commercial Company make two or three trips during the season that the Yukon is open to navigation, which generally lasts from June until October, the river being open at times at an earlier date than the anchorage off St. Michael's.

Tides.—The ordinary tides have a range of about 3 feet, but the rise and fall here, as well as in all of Norton sound, is affected by the wind, a long and continued gale from the southward causing a rise of tide of from 8 to 10 feet, while a similar gale from the northward will often cause a fall equally great.

Anchorage.—There is no harbour at St. Michael's and the anchorage is unsafe in bad weather. The depth at the usual places of anchorage is from 3 to 4½ fathoms, the latter depth being at a distance of 1½ miles from the landing. When a sea arises, vessels often have to shift anchorage into deeper water or leave altogether.

Directions.—In approaching Norton sound and St. Michael's from the southward, a good berth should be given to the mud flats and shoals extending from the delta of the Yukon. Vessels should keep in over 7 fathoms of water, as the depth shoals rapidly, and shoals are reported to be forming. The best course is to steer for cape Nome, from a position between cape Smith and St. Lawrence island. When within 10 miles of cape Nome, steer along the northern coast until cape Darby is sighted, then steer for Egg island. Egg island is a small low flat island, tapering from a low bluff to a low point at its eastern end. From Egg island the course to St. Michael's anchorage is S. by W. (S. 11° W.) and the distance 8 miles, the soundings decreasing from 7 to 4 fathoms, muddy bottom. The landing is indicated by a storehouse upon which a flag is hoisted when a vessel is sighted.

See chart, No. 2,460.

Stuart island.—This island has a low flat-topped hill in the centre.

Drift ice has been found in Norton sound as late as the 11th July. The position of the ice depends on the prevailing wind and the strength of the Yukon current. The ice is sufficiently heavy to require caution in vessels not built to encounter it. St. Michael's is considered closed to navigation after 15th October. All the ice in Norton sound forms every fall and disappears entirely in the following summer.

Golofnin bay.—There is a small island on the east side of Golofnin bay; anchorage has been found in 4 fathoms of water, immediately to the westward of it.

Sledge island.—A least depth of $6\frac{1}{2}$ fathoms has been found when passing in mid-channel inshore of this island. It is recommended to give the coast from this island to port Clarence a good berth.

Port Clarence.—This is a good harbour, close to the strait, free from ocean swell, and is the rendezvous for a large portion of the Arctic whaling fleet, who here await the tender from San Francisco, which supplies them with coal and provisions and takes back the oil and whalebone of the spring catch. As a general rule, the tender to the whaling fleet arrives at port Clarence from 1st to 5th July, without encountering any heavy ice. From here the whaling fleet go north into the Arctic in July. There is no native settlement of any size in the bay, but natives assemble here from the surrounding country and islands for trade with the whale ships.

Fresh water can be obtained in several places, the best being from a stream flowing into the bay on the east side and bearing E. by S. $\frac{7}{8}$ S (S. 69° E.) from point Spencer.

Point Spencer is in latitude 65° 16′ 40″ N., longitude 166° 47′ 50″ W.

Anchorage.—The best anchorage found was in $4\frac{3}{4}$ fathoms, just inside point Spencer and under the lee, from southerly winds, of a spit and shoal extending a short distance into the harbour from the main shingle spit. The holding ground is good, being mud and fine sand. There is good protection from north winds, but not much from south and west gales. There is some little range of tide, which varies with the wind as in Norton sound.

See charts, No. 2,460 and No. 593, point Rodney to point Barrow, with plan of port Clarence.

Grantley harbour, which extends eastward from port Clarence has a shoal entrance and can only be used by vessels drawing less than 12 feet. A large lake and river are beyond Grantley harbour.

Directions.—In approaching port Clarence, in thick or misty weather, the long, low spit of sand and shingle, which forms the west side of the bay, is not seen until it is close to. The best course from the southward is to steer directly for cape York, bearing in mind the set to the north-west, and after making cape York follow along the coast to the eastward, not too close, until the entrance to port Clarence is made out, then steer for the anchorage just inside point Spencer.

Reported shoals.—A shoal is reported to exist to the westward of the knuckle of the long spit ending in point Spencer, but with only 10 feet of water on it. Shoal water, with uneven and rocky bottom, has been found to such an extent in that vicinity that it is probable there are other spots with perhaps less water. It is recommended that vessels approaching port Clarence give the land a berth of not less than 2 miles from cape Douglas to a point 5 miles from the north end of point Spencer.

ST. LAWRENCE ISLAND.—A shoal with 3 fathoms or less water on it has been reported to exist off S.E. cape, St. Lawrence island. There are some Eskimo inhabitants who live in underground dwellings. Knives, razors, and biscuit, were used for barter with the natives in 1891, for furs of bear, fox, hair seal, reindeer, &c. The temperature of the sea in the middle of August, 1891, about half a mile from the shore was 31° to 32° Fahr.; this cold water only extended about 6 miles off shore, when it rose to 48°.

King's island is of small extent and about 700 feet high, with almost perpendicular cliffs and is steep-to on all sides. It is composed of basalt, has an exceedingly rugged outline and is destitute of trees or shrubs. On the summit of the cliffs are a number of stone columns, resembling the remains of some old feudal castle. It is inhabited and the village is remarkable, being composed of winter houses excavated in the sides of the cliffs and summer houses made of walrus skins. The north point of the island is in about latitude 65° 0′ N., longitude 168° 1′ W.

DIOMEDE ISLANDS.—The Diomede islands are formed of granite and rise abruptly from the sea with perpendicular sides;

See charts, No. 593 and No. 654, Bering strait.

they are steep-to and there are no beaches. The top of the islands is a sort of broken table land, the drainage from which has cut a few gullies in the granite bluffs. By digging into the rubbish, the natives have managed to obtain sufficiently level spaces to hold a few huts, and there are two villages, one on each island. Landing is difficult.

Fairway rock is uninhabited and almost inaccessible.

KAMCHATKA, EAST COAST.

VARIATION IN 1895.

Lower Kamchatka - - 2° 30′ E.

Winds and weather.—Dense fogs prevail along the whole of the east coast of Kamchatka during the summer months, when the winds are usually southerly. Sometimes these winds are very constant; in 1867 a schooner was unable to leave the river Kamchatka from June to the end of August for want of northerly wind. In September the weather is fine and although fogs occur, they are not so frequent nor so dense. In October westerly and north-west winds prevail.

North-west and westerly winds bring fine bright weather; easterly and south-east winds, cloudy weather with mist and rain.

Barometer.—In the west part of Bering sea and on the east coast of Kamchatka, the average height of the barometer in the summer months is 29·80. It sometimes happens that the barometer remains steady, whilst a considerable swell and the appearance of the clouds foretell bad weather; in these cases the barometer is affected after the gale is over. Also, sometimes the barometer rises or falls considerably, leading one to expect a strong breeze, and yet the wind hardly increases in force. Generally, any movement of the barometer accompanies a change of weather, but does not foretell it.

Dalni point lighthouse, in latitude 52° 53′ N., longitude 158° 47′ E., is stated by the Russians not to be in telegraphic communication with Petropaulovsk.

PETROPAULOVSK.—The town has a very dilapidated appearance, the houses for the most part being simply log huts, which are in a bad state of repair; the people are chiefly employed

See charts, No. 654, Bering strait, No. 2,388, sea of Okhotsk, and No. 1,040, Avatcha bay, with plan, Petropaulovsk harbour; also China Sea directory, vol. IV.

in hunting and fishing. The memorial of 1854 is a pretty monument, painted black with gilt decorations; a flagstaff and sentry box are close to it. It is a free port, the exports consist of furs, sables, &c., and the imports of articles of food from Russia and America. The rouble is the current money. All Russian orthodox holidays are kept. The quarantine regulations appeared lax in 1893, they are supposed to be looked after by a district doctor. There is said to be a considerable amount of venereal disease in the place. A Russian man-of-war is always in these parts on fishery duties. Mosquitos and sandflies are very plentiful.

Communication.—A Russian mail steamer calls twice a year, about 17th May and 1st August from Vladivostock, and there is one winter mail overland, *viâ* Siberia. A steamer belonging to the Russian sealskin company comes every year to collect skins and provision the settlements here and at the Komandorski islands, at the end of the season proceeding to San Francisco.

Supplies.—In 1893 provisions of fairly good quality were to be obtained. The prices were for beef 5¾d. per lb.; vegetables, which were very abundant, 1¼d. per lb.; and bread, which was not very good, 3½d. per lb. Butter of excellent quality was to be had from a farmer a mile or two outside the town. Live bullocks can be bought, but there are no sheep, fowls or eggs.

The best place for watering ship is at a stream bearing S.E. about 6 cables from Shackoff point, where it is unnecessary to pump the water into the boats as at the stream by the lighthouse.

Coal.—The Russian government have their own, stored in sheds which are situated north of the lake eastward of Shackoff point. From the sheds a small wharf projects, which is only fit for small craft. This coal is sometimes allowed to be used by men-of-war. It is Saghalin coal, not good, and dusty after burning. There are 3 or 4 lighters, which hold about 5 tons each and the bags have to be filled. The supply of coal must not be depended on, as the amount kept by the merchant is very uncertain, in September 1893 it was 70 tons. The price for Japanese coal was £3 10s. 1d. a ton, and for American Namaimo from £3 14s. 2d. to £4 6s. 7d.; both descriptions being very inferior. The firm of Walsh, Hall & Co. of Yokohama carry on an intermittent sort of trade in Japanese coal, &c., with the port, and generally send one steamer a year.

See chart, No. 1,040.

Position.—The old church, in latitude 53° 0′ 58″ N., is reported to be in long. 158° 39′ 15″ E.

Shoal.—It is reported that a shoal is extending in a W.S.W. direction from the harbour light, but the leading mark, triangular beacon in line with memorial, clears it.

Harbour.—To enter the harbour steer for the harbour lighthouse in line with the keeper's dwelling house bearing N.E. (N. 45° E.).

Inner harbour.—The inner harbour is very small, there is only room for one moderate sized vessel in it, unless moored head and stern. To enter keep in mid-channel between the spit and the left-hand shore. Heavy squalls, which are more frequent at night than in the day, come down from the northward between the hills and ships are apt to drag as the bottom is soft mud.

Tides.—The tides are very irregular. As far as could be ascertained there appears to be only one high and one low water in 24 hours at full and new moon ; at the quarters two as usual.

Cape Kronotski is reported to be in long. 162° E. Kronotskaia volcano (10,608 feet on chart) is an excellent mark, and is visible from a distance of over 100 miles in clear weather.

GULF OF KAMCHATKA.—**Cape Kamchatka** is about 1,500 feet in height, and from a distance it looks like a small island sloping to the eastward. The extreme of the cape is a sand spit, about 20 feet high, extending about one mile to the south-east from the foot of the mountains. This spit is strewn with immense pieces of rock, and there is a very conspicuous pile of rocks, about 40 feet high, at its extremity, which has the appearance of an old castle with turrets. The local inhabitants assert that a sunken reef extends 2 miles seaward from this pile.

The coast from cape Kamchatka trends W.N.W. and is precipitous, the hills forming the coast rising to an elevation of 900 feet, for a distance of 6 miles ; it then suddenly descends to about 40 feet and continues 2 miles further in the same direction. The coast then trends to the northward for a distance of about 7 miles ; the most noticeable features being the mouth of the Belaya (white) river and a perpendicular cliff of a dark grey colour, about 450 feet high, which may be distinguished from surrounding elevations by a total absence of vegetation. This cliff is in latitude 56° 5′ N., longitude 162° 42′ E. approximately.

See chart, No. 2,388.

Northward of this perpendicular cliff is a cove, where anchorage may be obtained in a depth of 15 fathoms; it is sheltered from N.N.E. to East, and although exposed to the swell from the south, which is always experienced during the summer months in the gulf of Kamchatka, boats can usually land. From the cove the coast trends N.N.W. and West about 6 miles to the mouth of the Kamchatka river, the last 1½ miles being the spit forming the south side of the river; near the mouth of the river the spit is only about 8 feet in height

Anchorage off Lower Kamchatka.—When approaching the Kamchatka river, with the object of communicating with the village, it is inadvisable to try and find the mouth of the river, as a stranger would not do so without the assistance of a pilot, and would probably ground on a sand bank. Men-of-war would not be in the best position for communicating if anchored off the mouth, but merchant vessels would probably anchor there to land or ship cargo. The best plan for men-of-war is to make the white cliffs, westward of cape Africa, and then proceed along the coast at a distance of about 5 miles, past the perpendicular cliff, when the village can be seen, with the watch tower or signal station, which is a high quadrangular wooden tower with a flagstaff; the village buildings have the appearance of being on the long stretch of spit, but in reality are on the opposite side of the river.

The spit can be boldly approached steering towards the signal tower, and anchorage obtained in 6¾ fathoms, with the signal tower bearing N. 6° W. and the perpendicular cliff S. 68° E.

Landing may be effected on the spit, but it is not at all an easy matter, as even in the quietest weather with the wind off shore, there is a considerable surf on the beach, and if once ashore, in a few hours it may be impossible to get off again. The village is then reached by boat or canoe in the river, which is not at all broad abreast of it.

Kamchatka river.—Vessels drawing 8 or 9 feet can enter the river at high water, but must take a pilot, as the channel frequently changes, particularly after strong southerly winds. The channel is between the reefs off two spits, which divide the river mouth from the sea, and the depth on the bar is 6 feet at low water. Vessels in the river can anchor off the village. The river is very shallow inland, even boats have considerable difficulty in passing up and down it.

See chart, No. 2,388.

Caution.—Boats should not be sent from vessels off the mouth of the river to cross the bar except at high water, as at low water the surf is very violent, both on the bar and in the channel, and on this account it is not easy to distinguish the channel.

Pilot.—There is one pilot here, with a pupil; the calling is hereditary. The pilot places his own marks. To obtain the services of the pilot it is necessary to send for him, as he has no proper boat.

Tides and tidal streams.—The approximate time of high water, full and change, is 4h. 0m., rise 6 feet.

The tidal streams run strongly in the river.

In the month of June the river is in flood, and the water rises near the village about 9 feet above its ordinary height. In September the river is at its lowest, the tidal stream then takes salt water up to the village. This does not happen at other times, because the river current checks the tidal stream, and it is the meeting of the current and stream that renders the bar so dangerous at low water.

Lower Kamchatka village.—The proper name for this village is Ooskamchatka, which means "Heads of Kamchatka"; it has a population of 100. The nearest villages are Nisnakamchatka, distant 35 miles, with a population of 120, and Kanaki, population 100. The principal town hereabouts is Klutchi, with a population of 600; it is situated at the foot of mount Klocheffskaia, and is 120 miles from Ooskamchatka by road, but only 60 miles as the crow flies. The country round about is very sparsely populated.

The inhabitants take little trouble to improve their condition, their log huts are of the rudest description, they live on dried fish; in the summer they are idle, and in the winter hunt for skins, which are obtained in considerable numbers.

Communication.—There is communication with Petropaulovsk twice a year, in winter once by sleigh, and in summer about August, a Russian steamer takes supplies and returns with skins.

Supplies.—Fish is the only description of food obtainable, excellent salmon are to be had in large quantities, at a nominal price. There are many ptarmigan, which are good eating, and large numbers of duck, but the inhabitants never shoot them. There are also some cattle, but they are not killed for meat.

Forests of larch, making capital building timber, grow on the banks of the river.

Ice.—The river freezes in October or the beginning of November, and is free of ice in May.

Cape Kamchatka, Northward.—The coast from cape Kamchatka trends to the north-eastward for a distance of about 13 miles to cape Africa; it forms three rather open coves, and is mountainous and precipitous.

Cape Africa, approximately in latitude 56° 6′ N., longitude 163° 25′ E., is remarkable by a solitary peak about 1,200 feet high, from which the cape stretches into the sea in three flat and smooth declivities. The extreme of the cape is a sandy spit, which extends about one mile to seaward, and possibly a reef extends from the spit. Westward of the peak is an elevated plain, which extends 5 miles and has the appearance of a table mountain. From a distance of about 6 miles off the coast between capes Kamchatka and Africa, no signs of sunken rocks are observable in clear weather, nor, according to the statement of a captain of a trading steamer who has navigated along the coast for many years, are there any such rocks to as far north as cape Stolbovi.

KOMANDORSKI ISLANDS.

VARIATION IN 1895.

Nikolski - - - - 4° 15′ E.

Decreasing 3′ annually.

Supplies.—No coal, supplies, or provisions of any sort were to be obtained at the Komandorski islands in 1893. A small store is kept up at Nikolski by the Government for the use of the people employed about the seal fishery, and there are probably others at the different villages, but they are not large enough to supply any outside demand. There are cattle, but they are not allowed to be killed at present, as it is wished to increase them by breeding. Permission can be obtained from the Russian official in charge to land live stock at Nikolski, if a ship happens to bring any from Petropaulovsk, for consumption whilst cruising on the fisheries. Vegetables will grow, but the inhabitants are too indolent to cultivate them.

See chart, No. 1,644, Komandorski islands; with plans, Medni island: Nikolski anchorage; Starava harbour: Preobrajenski harbour: Pestchanni bay.

Reindeer have been placed on Bering island and have done well, some were to be killed in the winter of 1892-93.

Fish, salmon and cod, can be caught in any quantity. There are a few duck on the lakes near Nikolski.

Inhabitants.—The inhabitants of these islands are there simply on account of the seal fisheries, and they live mostly on fish, which are abundant, and seal meat.

Communication is kept up with Petropaulovsk during the season by a small steamer belonging to the sealing company.

Winds and weather.—In August the winds experienced were very variable both in direction and force; the wind being seldom steady in any direction for a length of time. Winds from North to West generally bring fine bright weather, but from N.E. to S.E. are nearly always accompanied by dirty weather, rain and fog.

Fog.—May and June are the worst months, during these months navigation is very difficult. In June 22 days of thick fog have been experienced. There is a considerable amount in August.

Barometer.—The average height of the barometer in the summer months is 29·80.

Temperature.—The mean temperature in 1882 was for May (the last 10 days) 39° Fahr.; June 43°; July 48°; August 54°; September 50°.

Currents.—The currents around the islands are very uncertain; with strong winds a set of about half a knot an hour to leeward has sometimes been experienced.

BERING ISLAND.—Nikolski anchorage.—Vessels approaching Nikolski cannot fail to recognise the most conspicuous and remarkable flat-topped hills at the back of the anchorage. The belfry of the church is easily seen.

Position.—The observation spot at Vkhodni point is in latitude 55° 10′ 30″ N., longitude 166° 0′ 58″ E.

Dangers.—Midway rock, which lies midway between Sivutchi and Toporkof islands, is above water at all times and breaks in ordinary weather.

There are two rocks, which break, S.W. by W. ½ W., 4 and 9 cables from Vkhodni point, and there are three rocks in the roadstead, bearing

See chart, No. 1,644.

from the belfry about W. by N. at distances of 4, 6, and 7½ cables. Besides the above-mentioned rocks, there are two patches of 21 feet, to the N.N.E. and under two cables from the outer two rocks in the roadstead.

The bay is said to be dotted with rocks and it should be navigated with the greatest care.

Directions.—From the north-west, round Sivutchi (which is 150 feet high and easily seen) at the distance of half a mile, then steer about E. ¼ N. (N. 87° E.) with Toporkof island (a small flat island about 30 feet in height) on the port bow. Pass about 3 cables to the south of this island and steer to the north-eastward until Sivutchi and Toporkof are in line, then alter course for the anchorage, keeping clear of the rocks before mentioned, and anchor in 7 fathoms, sand. From the southward keep outside Toporkof until able to follow above directions. The passage to the northward of Toporkof is not recommended.

The anchorage is open to all winds from the westward and there is always a ground swell, which increases rapidly with rising wind; this makes the anchorage undesirable and even dangerous, but it is the best in the island. Heavy rollers set into the anchorage with any wind with westing in it. Vessels should be ready to proceed to sea at short notice, for the weather changes very quickly at times.

Landing.—The best landing is on the beach at the storehouse inside Vkhodni point.

North-west point, approximately in latitude 55° 15′ N., longitude 165° 45′ E., should not be approached within 4 miles, as a most dangerous reef extends a great distance to the westward from it.

Yushin point is a reef of rocks running out about one mile and dry at low water. The small island on the chart is simply the highest part of the reef and is about 10 feet above high water. The principal seal rookery in the islands is on this point; thousands of seals are to be seen and make a wonderful sight. In approaching this point use great caution and keep a masthead look-out for scattered reefs, of which there are many. The salt house, a red wooden building close to the water's edge with a few huts and a couple of small wooden houses (one red) eastward of it and

See chart, No. 1,644.

further up the hill, bearing S. by W. (S. 11° W.) is said to be a safe line of approach. Anchorage may be obtained in 7 to 10 fathoms, with the highest part of the reef bearing W.S.W. (S. 67° W.), this is good with winds from S.E. through south to S.W., but not with winds from any other direction. The reef on the left entering extends a considerable distance out and must be guarded against, as must also the possibility of there being other rocks in this vicinity.

In fog the noise made by the seals might possibly be heard a considerable distance.

Podvodni rock is a small rock about 6 feet above high water.

The north coast of the island and cape Vakselya should not be approached within 4 miles in passing.

Staraya harbour.—The distance from Staraya to cape Vakselya is reported to be 5 miles. The mud houses of sealers are not easily seen. When approaching the harbour on a westerly bearing the depths decrease with regularity; at a distance of 3 miles from the shore the depth is 25 fathoms, bottom mussels; at 2 miles 15 fathoms, bottom sand and rock; a large vessel should anchor here.

The north reef of the harbour is composed of rocks partly above and partly below water, on which the sea constantly breaks. The south reef is composed of rocks, 2 to 3 feet high, separated by narrow channels; the eastern part of the reef is formed by isolated rocks awash, over which the sea breaks.

Only small vessels should enter the harbour; there is no difficulty in entering, as the channel is well defined by the breakers on both sides. It is necessary to hug the south reef, which has no sunken rocks off it (except one in the narrowest part, almost touching the shore). The depth in mid-channel is 7 fathoms, and in the harbour 15 to 30 feet, sand bottom.

The inhabitants say that the water in the harbour is smooth even in north-east winds, as the sea breaks against the outer rocks.

Settlement.—In the south-west part of the harbour is a settlement of Aleut hunters: there are seven families who dwell in earth huts. The settlement is approximately in latitude 55° 9′ 20″ N., longitude 166° 17′ E.

Water.—In the west part of the harbour is a rivulet of good water.

See chart, No. 1,644.

Cape Monati is very high and precipitous; it may be seen from a distance of 30 miles.

MEDNI ISLAND.— Pestchanaya bay.—There is anchorage in the north-west part of this bay in from about 3 to 12 fathoms, sand. It is more sheltered than the anchorage off Preobrajenski harbour, but is subject to an almost constant swell, which rolls in, rounding Pestchani point, even in northerly winds, against which the bay is sheltered by a high mountain.

Landing is very difficult, and without due care a boat may be capsized.

Preobrajenski is the winter settlement. Anchorage may be obtained off the harbour in from 14 to 20 fathoms, with the church in line with a very conspicuous pinnacle rock close under a precipitous cliff. It is open to winds from N.W. through north to the eastward. The church is approximately in latitude 54° 47′ 20″ N., longitude 167° 40′ 30″ E.

Glinka bay (erroneously called Peschanni bay on chart No. 1,644) affords good shelter with winds from S.S.E. through west to North. The soundings appear to be less than charted.

Directions.—Keep a sealer's house on the northern point of the bay bearing W. by N. (N. 79° W.) till the large store house in the centre front of the village bears W.S.W. (S. 67° W.), when steer for it and anchor in 7 fathoms with the southern point of the bay bearing S.E. (S. 45° E.). The sealer's house stands by itself and there is a small waterfall just behind it. There is a large water-course of light colour nearly behind the large store house. It is an exceedingly picturesque little place.

Seal rookeries.—The great seal rookeries are all on the rocky points on the south-west side of the island.

Anchorage has been obtained in 12 fathoms, rocky bottom, about three-quarters of a mile from the shore, off the rookery south of Palata point.

KARAGINSKI ISLAND.—Breakers extend to the S.S.E. of the south end of this island for a distance of about 6 miles, and accordingly this end of the island should be given a very wide berth.

See chart, No. 1,644, and No. 2,388.

GULF OF ANADYR.

VARIATION IN 1895.

Providence bay - - - - - 17° E.

ANADYR BAY.—Raid bank.—The shoal round Raid rock extends a distance of 1½ to 2 miles in north-east, east, and south directions from the rock. It breaks slightly on the south end over which is a depth of 3 feet, but on Raid rock itself heavy breakers have been seen.

Cape Alexander.—Shoal.—On the east side of cape Alexander at a distance approximately of from 2 to 4 cables, is a bank with 10 feet water on it. The bank is of hard sand; it appears to be of small extent and is marked by an irregular ripple; the depths around are 7 and 8 fathoms.

Anchorage.—The best position to anchor in the mouth of the river Anadyr is midway between cape Alexander and Observation point in a depth of 6 to 7 fathoms, ooze bottom; only the ebb stream is said to be felt here, the flood running along the north shore.

Tide and tidal stream.—It is high water, full and change, near cape Alexander at 4h. 0m.

The tidal stream in Anadyr bay is very strong; in the mouth of the river its rate is about 4½ knots an hour.

This stream renders communication with the shore very difficult, and anchorage in the bay inconvenient.

Mount St. Dionysius, in latitude 64° 36′ N., longitude 177° 17′ E., standing apart to the south-west of the cape of the same name, is the most noticeable of the mountains in this vicinity; generally, however, its base and summit are shrouded in fog, leaving the middle part only visible.

Geka point has the appearance of a low sandy bank, a foreign village is situated on it; this promontory is separated from cape St. Dionysius by a spacious shallow bay.

Settlement.—A Russian settlement, named Novo-marinsk was founded in 1889 on cape Alexander. There is a low timber house and three or four huts belonging to a nomad people, the Tchutchi, who dress in skins and are friendly.

See chart, No. 654, Bering strait.

Ice forms in September, and breaks up at the beginning of June.

Holy Cross gulf.—A shoal, with 3¼ fathoms of water on it, is reported to exist about 2½ miles westward of cape Meechken.

Providence bay.—A rocky shoal, with 12 feet of water on it, is reported to lie south-east of cape Lisaja-golowa (Bald head) with the cape bearing N. 45° W., and the village at the head of lake Moore N. 62° E., distant 1¼ miles.

Discoloured water has been observed at the entrance to Providence bay.

Cape Lisaja-golowa is noticeable, being of a red colour.

Plover harbour.—Anchorage has been obtained here in 16½ fathoms, sand. There was a settlement, but no supplies in 1891. The longitude of this place has been independently determined from St. Petersburg and San Francisco. The surroundings of the anchorage are barren and dreary, the rocky hills covered with material comminuted by the frost and presenting little vegetation, except a luxuriant growth of lichens. The people here are the Asiatic Eskimo, (described by Nordenskjold,) modern emigrants from America, few in number, and deteriorated by the use of alcohol obtained from illicit traders.

COAST OF EASTERN SIBERIA, BERING STRAIT.

Cape Tchaplin (Indian point), in latitude 64° 25′ N., longitude 172° 14′ W., of late years a rendezvous for vessels, is a long, low point of shingle and sand, extending several miles to the eastward from the main land. There are 9½ fathoms of water at 1½ miles eastward of the point.

Anchorage has been obtained, in southerly winds, on the north side of the point, abreast the main portion of the native settlement, in 7½ fathoms of water, hard sand and gravel bottom, and at a distance of half a mile from the beach. In northerly winds, it is stated that an equally good anchorage can be found on the south side of the cape, in about the same depth of water. Landing is easily effected upon a steep shingle beach.

Village.—The native village is a large and prosperous one with a population of about 350. The inhabitants appear to be Eskimo and

See chart. No. 654.

closely allied to the natives on the Alaskan side: they seem intelligent, and are good traders and whalemen. One of the natives has a frame house, containing a store with a large supply of articles, such as flour, tobacco, rum, potatoes—obtained by trading whalebone with the whalers, who come here in large numbers in the spring of the year. A number of American-built whale-boats have been seen on the beach. Some of the natives here speak fair English. Neither wood nor water can be obtained. Deer skins are procured from this place for clothing by whalers.

Seniavine strait.—A shoal is reported between Nouneangane and Ittygrane islands, extending in a north-east and south-west direction, with $2\frac{1}{2}$ fathoms of water over it, rocky bottom.

Kayne island.—Cape Kiguinine, the east point of Kayne island, should be given a wide berth, as shoal water, with uneven bottom, extends off it.

Mechigme bay is reported to be an excellent harbour, land-locked, with 14 fathoms at the entrance, and with a depth of 5 fathoms extending inside for a distance of several miles.

St. Lawrence bay.—Water can readily be found here.

See chart, No. 654.

INDEX.

	Page
Acherk harbour	...39. 40
Adugagh island	... 51
Afognak bay	... 25
——— island	... 25
Africa, cape	...65, 67
Agattu island	... 53
Aghiyuk island	... 33
Akun cove	... 44
—— pass	... 44
Akutan harbour	... 44
——— island	... 44
——— pass	... 43
——— pass, ice	... 42
——— volcano	... 44
Alaganik settlement ...	... 10
Alaska Commercial Company	5. 9, 11, 20, 44. 58. 59
—— peninsula	37. 38
Albatross bank	... 6. 24
Aleks rock	... 40
Aleutian islands	... 43
———————, tidal streams	... 42
———————, weather ...	... 41
———————, western. caution	52
Alexander, cape	... 72
———————, anchorage	... 72
———————, shoal ...	... 72
———————, tides and tidal streams...	... 72
Aliaskin, cape	... 37
Alitak bay	... 31
———————, canning establishment	31
———, cape	... 32
———————, anchorage ...	... 32
Alsentia bay	...31, 35
———————, rock	... 31
——— village	... 31
Amagat island	... 39
Amaknak island	...47, 48
Amatignak island	... 53
Amatuli island	... 18
———————, tidal stream	... 18
Amlia island	... 53
Amukta island	... 52

	Page
Anadyr, gulf of	... 72
———————, currents ...	... 42
——— river, anchorage ...	... 72
———————, ice	... 73
Anchorages	... 34
Anchor point...	... 20
Anderson rock	... 40
Archimandritof rocks ...	... 19
Arctic whaling fleet ...	... 60
Atka island	... 52
Attu island	... 53
———————, water	53
Avatanak island	.. 44
Augustine island	... 23
———————, rocky patch	... 23
Ayalik bay	... 16
Bailey harbour	... 39
Bainbridge, port	... 14
Baird bank	... 6
Barnabas, cape, rock off ...	... 30
Barometer, east coast of Kamchatka	... 62
Barren islands	...17. 18
Baum, cape	... 38
Beaver bay	... 37
——— inlet	.. 45
Bede, cape	... 19
Belaya river	... 64
Belkoffski bay	... 39
Bering island	... 68
———————. north coast ...	... 70
——— sea	... 41
———————. currents ...	...41, 42
———————, ice	... 42
———————, tidal streams ...	... 42
———————, winds	... 41
——— strait	... 73
———————, currents ...	... 42
Big Koniushi island... ...	... 35

	Page
Biorka, cape	45
——— island	45
Black bluffs	...54, 55
——— point	...30, 31
Blighs island.	12
Bluff point	...20, 38
Blyings sound	16
Bogosloff islands	51
———————, shoal water ...	51
Bomehoi island	52
Bryant point	15
Captain's bay	43, 46
———————, tides and tidal streams	48
Castle rock	35
Caton cove	39, 40
Caution, Aleutian islands, western	52
Chalk patch	27
Chalmers harbour	...15, 16
Channel rock...	27
Chatham, port	18
———————, tides	19
Che rful, cape	46
Chernoffski church	50
——— harbour...	49
———————, anchorage ...	50
——— ———————, directions ...	50
———————, tide	50
———————, water ...	49
——— village	49
Chesloknu bay	19
Chichagoff harbour	53
———————, rock	53
Chiniak bay	34
Chinitua	22
——— bay...	..22, 23
Chirikoff island	34
———————, anchorages ...	34
Chisick island	22
Chiswell islands	16
Chowiet island	33
Chudinadak island	52
———————, anchorage ...	52
———————, reef	52
Chugachick bay	...18, 19
Chugal island	53
Chugatz islands	17
Clarence, port	60
———————, anchorage	66
Clarence, port, directions	61
———————, shoals	61
———————, tide	60
Cleare, cape	15
Coal	5, 20
——, Cook's inlet	20
——, Dutch harbour	5, 47
——, Humboldt harbour	36
——, Iliuliuk harbour	5, 48
——, Kadiak island...	5, 26
——, Petropaulovsk	5, 63
——, St. Paul harbour	5, 26
——, Sand point	36
——, Unalaska	5, 47, 48
——— bay	19
———————, anchorage	19
——— ———, tide	20
——— ———, tidal streams	20
——— harbour	19
Cochrane point	13
Communication	5
——— ———, Dutch harbour ...	5, 47
——— ———, Humboldt harbour	5, 36
——— ———, Kadiak island ...	5, 26
——— ———, Karluk	5
——— ———, Komandorski islands	5
——— ———, Lower Kamchatka	66
——— ———, Nutschuk ...	5
——— ———, Petropaulovsk ...	5
——— ———, St. Paul harbour...	5, 26
——— ———, Sand point ...	5
——— ———, San Francisco ...	5
——— ———, Sitka	5
——— ———, Townsend, port ...	5
——— ———, Unalaska	5
——— ———, Unga	5
——— ———, Vladivostock ...	63
Cone peak	53
Constantine bay	46
——— ——— harbour	11
Controllers bay	10
Cook's inlet	17
———————, coal	20
——— ———, directions	23
———————, kelp	20
——— ———, tidal streams	18
———————, winds	17
Copper river	10
Coral rock	15
Cordova bay	...11, 12
Countess point	13
Crater point	53

	Page
Currents, Bering sea ...	...41, 42
——— strait	42
———, cape Navarin	41
———, gulf of Anadyr... ...	42
———, Kemandorski islands ...	68
———, St. Lawrence island ...	42
———, St. Paul island	55
Dalni point lighthouse	62
Dalnoi point	56
Dangerous cape	...19, 29
Darby, cape	59
Davidson bank	6, 43
Days harbour	16
Delaroff harbour	36
Devil's prongs	26
——— thumb	28
Dick, port	17
Diomede islands	61
Dolgoi island...	38
Douglas, cape ...	17, 18, 23, 61
Drift ice, Norton sound	60
Dutch harbour	47
———, anchorage ...	48
———, beacon	47
———, buoy	47
———, communication ...	47
———, coal	47
———, directions... ...	48
———, jetty	47
——— ———, North American Commercial Company, depôt	47
———, supplies	47
——— ———, tidal stream ...	49
———, tides	48
——— ———, water	47
Eastern Siberia, coast	73
East Foreland	...18, 20
———, shoals	20
—— point	50
Egg island	...45, 59
—— islet	32
Elizabeth, cape	18
Elrington point	14
English bay	45
Erskine point	46
Esther island...	13
Etches, port	...10, 11
Etolin, cape, anchorage	58
Fairway rock	62
Fidalgo, port...	12
Fishing banks	6
——— stations	35
Flat island	19
Fountain rock	9
Four Mountains, islands of ...	52
———, tidal streams	52
Fox islands passes	43
Freemantle point	...10, 13
Gattan, cape	49
Geese islands...	31
———, rock	31
Geka point	72
Glinka bay	71
———, directions	71
Golofnin bay, anchorage	60
Goloi island	38
Gore point	17
Gormans strait	37
Graham, port	19
Grantley harbour	61
Gravina, port	12
Green island	10, 13, 14
Greville, cape	...28, 29
Gull island	37
Hall island	57
Hanning bay...	15
Harriet point, shoal...	21
Hawkin island	...10, 11
Henderson island	37
High island	37
Hinchinbrook, cape	9, 10, 15
——— island	10

	Page
Hobron, port	30, 34
———, water	30
Holiday island, rock off	27
Holy Cross gulf	73
Humboldt harbour	36
———, buoys	36
———, coal	36
———, communication	36
———, directions	36
———, light	36
Hutchinson hill	54
——— reef	26, 28
Ice, Akutan pass	42
—, Anadyr bay	73
—, Bering sea	42
—, Kamchatka river	67
—, Pribiloff islands	42
—, St. Matthew island	42, 57
Icy bay	13
— cape	7
Ikatik, cape	32
Illamna volcano	22
Iliasik islands	33
Iliuliuk harbour	48
———, anchorage	48
———, buoys	48
———, landing	48
———, coal	48
———, tidal stream	49
———, water	48
Indian point	73
Inner Humpback	27, 28
Irishman's hat	49
Ittygrane island	74
Johnstone point	10
Kachekmak bay	19
Kadiak island	25
——— rock	26
Kaknu river	20
Kalekhta, cape	16
Kalgin island	21
———, shoals	22
Kalisin reef	27
Kamchatka, gulf of	64, 65
———, cape	64, 67
———, east coast	62
———, barometer	62
———, winds and weather	62
———, river	65
———, caution	66
———, ice	67
———, pilot	66
———, tides and tidal streams	66
Kamishak bay	22
Kanaki	66
Karaginski island, breakers off	71
Karluk bay	32
———, tides	33
———, cape	32
——— head	32
——— spit	32
———, salmon canneries	32
Karpa island	37
Kayak island	8
Kayne island	74
Kelp, Cook's inlet	20
Kenai peninsula	13
Khituk, cape	40, 43
Kiguinine island	74
Kiliuda bay	29, 34
King's island	61
Kiyavak bay	35
Klocheffskaia, mouni	66
Klutchi	66
Knights island	13, 11
Knik river	21
Knowles head	12
Komandorski islands	67
———, barometer	68
———, communication	68
———, currents	68
———, fog	68
———, supplies	67
———, temperature	68
———, winds and weather	68
Korovin islands	37
——— strait	37
Kronotskaia volcano	64
Kronotski, cape	64

	Page
Kululak ground	6
Kussilof, cape	20
———, shoal	20
——— river, buoys	20
———, tide	20
Kyska	53
Latouche island	14
Lazareff, cape	40
Lazy bay	32
Lenard rock	40
Lida island	...39, 40
Lighthouse rocks	34
———, rookery	34
Lisianski bay	...30, 34
Lisaja-galowa, cape	73
Little Koniushi island	35
Long island	26
———, breaker off	26
———, rocks off	26
Lower Kamchatka	65
———, anchorage ...	65
———, communication	66
———, landing ...	65
———, supplies ...	66
———, village ...	66
Luckannon bay	...54, 55
McDonald bay	53
Mackenzie point	...21, 23
Macleod bay	15
———, anchorage	15
Magnet island	19
Makushin bay	49
Manby point	7
Marmot bay	34
——— island	25
Mechigme bay	74
Meechken, cape	73
Middleton island	9
———, foul ground ...	9
———, rock	9
———, sunken reef ...	9
———, tidal streams ...	9
Medni island	71
———, anchorage	71
Monati, cape	71
Monolith point	53
Montague island	10, 13, 14
Morgan, cape	44, 45
Moss, cape	38
Moushukli island	21
Munina, anchorage	20
———, reefs	20
——— village	20
Nagai island	...35, 36
——— rocks	34
Narrow strait	34
Navarin cape, currents	41
Nazan bay	52
———, tides	52
Near islands	73
——— island, shoals off	27
Neil Juan, cape	56
N.E. point	54
Nikolski	51
———, anchorage ...	...52, 68
———, dangers ...	68
———, directions ...	69
———, landing	69
———, supplies	...67, 68
Ninitchick	20
Nisnakamchatka	66
Nome, cape	59
North American Commercial Company	5, 47, 55
——— anchorage	56
North-east cape	53
Northern strait	32
North Foreland	18
———, anchorage ...	21
———, salmon ... ... tablishments	21
——— hill	74
——— Passage rock	16
North-west point	69
——— reef	53
Norton sound	58
———, drift ice	60
———, tides	59
Nouneangane island	74
Novo-marinsk settlement	72

	Page
Nowell peninsula	10
——— point	13
Nuka bay	17
Nunivak island	58
———————, shoals	58
Observation point	72
Observatory point	50
Ocean cape	7
Old harbour	...30, 34
———————, directions	30
Olga bay	31
Ooskamchatka	66
Orca	12
Otter bay	37
——— island	53
Outer Humpback	...27, 28
——— Spruce cape, rock off ...	27
Pacific Coast Steamship Company	5, 48
Palata point	71
Pamplona bank	7
Pankoff, cape	40
Passage canal	13
——— island	19
Pavloff harbour	39
Pestchanaya bay	71
———————, landing	71
Petersen bay	39
Petrof peninsula	40
Petropaulovsk	62
———————, coal	63
———————, communication ...	63
———————, harbour	64
———————, inner harbour ...	64
———————, memorial	63
———————, position	64
———————, shoal	64
———————, supplies	63
———————, tides...	64
———————, town	62
———————, water	63
Phipps, cape	7
——— point	11
Pinnacle island	57
——— rock	47
Pisa tower rock	53
Plover harbour	73
Podvodni rock	70
Pogrumnoi mountains	43
Popoff island, Red cove	36
——— strait	36
Porpoise harbour	36
——— rocks	11
Portage bay	37
Portlock bank	6, 24
——— streams	24
Possession point	20
Preobrajenski, anchorage	71
——— harbour	71
Pribiloff islands	53
———————, ice	42
———————, weather	41
Priest rock	...46, 49
Prince William sound	10
Promontory cape	40
Providence bay	73
———————, shoal	73
———————, discoloured water	73
Puget, cape	16
Pye islands	16
Pyke point	14
Raid bank	72
——— rock	72
Range point	53
Raspberry island	...25, 32
Rat islands, reef	53
Red cove	36
Redoubt bay	...18, 21
——— volcano	22
Reef point	..54, 55
Resurrection bay	16
Riou, point	7
Rocky point, buoy	47
Round Lumpy rock, breaker off ...	27
Rush rock	39
Russian harbour	...31, 35
St. Dionysius, cape	72
——— —, mount	72

	Page
St. Elias, cape	8
———, reefs off	8
———, mountain	7
St. George island	56
———, landing	56
———, tidal streams ...	56
———, tides	56
——— rock	26
St. Lawrence bay	74
——— island... ... ...59, 61	
———, currents ...	42
St. Matthew island	56
———, anchorage ...	57
———, islands, ice 42, 57	
———, island, landing ...	57
———, tides and tidal streams ...	57
St. Michael's	58
———, anchorage	59
———, directions	59
———, landing	29
St. Orlovsk settlement	25
St. Paul harbour	
———, anchorage ...26, 29	
———, bank in	28
———, coal	26
———, communication	26
———, dangers	26
———, fogs	28
———, North channel ...26, 28	
———, directions	28
———, position	26
———, South channel ...27, 28	
———, directions	28
———, tidal streams	28
———, supplies... ...	26
———, village	25
———, wharf	29
——— island	54
———, anchorage... ...54, 55	
———, currents	55
———, landing	55
———, rocky patch ...	54
———, tidal streams ...	55
———, village	55
Saldovia bay	19
Salmon bay	39
Samalga island	52
Sanborn harbour	36
Sand point	36
Sandy cove	35
——— point	36
Sannak bank...	6
——— islands	39
Sarycheff strait	57
Scotland rock	37
Seal cape	40
Sea Lion neck	54
——— rocks	25
Seal rocks 10, 16, 32	
——— rookeries	71
Seals	55
Sea Otter island	25
——— reef	9
———, overfall	9
Semidi islands	33
Seniavine strait	71
———, shoal	74
Shaw bay	41
——— island	23
Shishaldin peak	41
Shumagin, bank	6
——— islands	35
———, bank and shoal	35
Shuyak island	24
Signals, The	45
Signum island	52
Sitchinak island	33
——— ... ... rocks	33
——— strait	31
——— ... tidal streams ...	31
———, tide rips	31
Sitka, communication	5
Sitkalidak island	30
——— strait 68, 69	30
Sivutchi island	13
Skillokh, lake	60
Sledge island...	6
Slime bank	59
Smith, cape	12
Snug corner cove 22, 23, 32	
——— harbour	36
South channel directions	27
———, rock in	16
——— Passage rock	60
Spencer point	17
Spithead beacon	25
Spruce island	25
———, sunken rock ...	70
Staraya harbour	70
———, settlement ...	70
———, water	67
Stolbovi, cape	

80 11803

	Page
Stony point	54
Stuart island...	60
Suckling, cape	7, 8
Sugar loaf peak	56
Summer bay	46
S.W. point	54
Tchaplin, cape	73
———, anchorage	73
——— village	73
Tchutchi	72
Thin point	39
Three Saints bay	...30, 35
——— village	30
Tides and tidal streams, Akutan pass	45
———, Aleutian islands ...	42
———, Alexander, cape	72
———, Amatuli island	18
———, Bering sea	42
———, Captains bay	48
———, Chalmers harbour	16
———, Chatham, port	19
———, Chernoffski harbour	50
———, Clarence, port	60
———, Coal bay ...	20
———, Cook's inlet	18
———, Dutch harbour	49
———, Four Mountains, islands of	52
———, Hiuliuk harbour	49
———, Kamchatka river	66
———, Karluk bay	53
———, Khitrak, cape	43
———, Kussilof river	20
———, Middleton island	9
———, Nazan bay ..	52
Tides and tidal streams, Norton sound	59
———, Petropaulovsk	64
———, Portlock bank	24,
———, St. George island	56
———, St. Matthew island	57
———, St. Paul harbour	28
———, St. Paul island	55
———, Sitchinak strait	31
———, Turnagain arm	21
———, Unalga pass	45, 46
Tigalda island	...43, 44
Tignagvik point	... 22
Tonki cape bay	... 25
Torporkof island	...68, 69
Townsend, port, communication ...	5
Track, Sand point to cape Pankoff	38
Trading bay	... 24
———, shoal water ...	... 21
Trinity, cape	... 31
——— islands	... 33
Tugidak island	... 33
———, breakers off	... 33
———, shoal water	... 33
———, sunken rocks	... 33
Turnagain arm	13, 18, 21
———, anchorage	... 21
———, shoal ...	... 21
———, tides ...	... 21
———, tidal stream	... 21
——— island	... 21
Turner point	... 7
Tustumena lake	... 13
Two Headed island	...30, 31
Tyonick village	... 21
Uyak bay	...
... island ...	...
Ugan... island ...	...43, 44
... pass	44
Ugamak bay, anchorage .. .	...
Ujut bay	31

	Page
Ukolnoi island	37
Umga island...	39
Umnak island	51
——— pass	51
Unalaska island	...45, 46
———, S.W. and South coasts ...	50
Unalga island	45
——— pass	...43, 45
———, tides	45
———, tidal streams... ...	46
Unga island	...36, 37
——— strait	... 37
Unimak island	40
——— pass	... 43
Upright, cape	56
Uyak bay	33
———, anchorage	33
Vakselya, cape	70
Valdes, port	13
Vasilief reef	27
Village cove	55
Volcano bay	49
Vsevidoff volcano	51
Walrus island	...54, 55
———, landing	55
Waters point	14
Weather, Aleutian islands	41
———, Pribiloff islands	41
Wells, port	13
Western Aleutian islands, caution	52
West Foreland	18, 20, 21
———, rock	21
Whitshed, cape	10
Williams reef	...26, 28
Winds, Bering sea	41
——— and weather, east coast of Kamchatka	62
Wingham island	8
Wislow island	49
Woodcock point	15
Wooded island, buoy	27
——— islands	15
Wosnessenski island	37
Yaktage, cape	7
Yakutat bay	7
———— anchorage	7
York, cape	61
Yukon harbour	35
——— river	...58, 59
Yunaska island	52
Yushin point	69
———, anchorage	70
———, rookery	69
Zachareffskaia bay	37
Zapadnie bay, anchorage	56
——— ——— reef	56

LONDON:
PRINTED FOR HER MAJESTY'S STATIONERY OFFICE
BY DARLING & SON, LTD., 1, 2, 3, & 5, GREAT ST. THOMAS APOSTLE, E.C.
1895.